

Home Fruit & Grower

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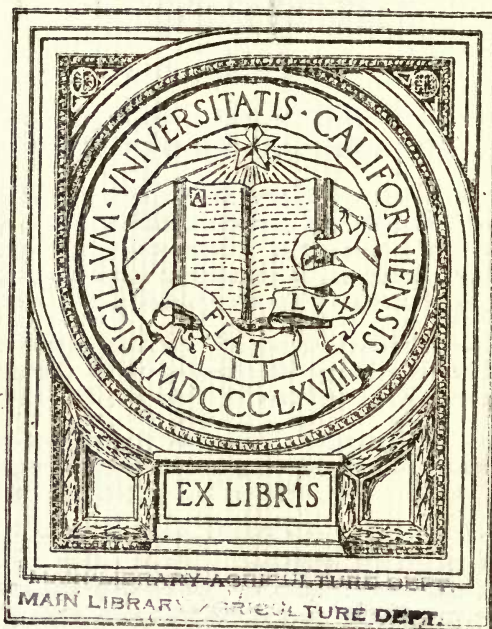
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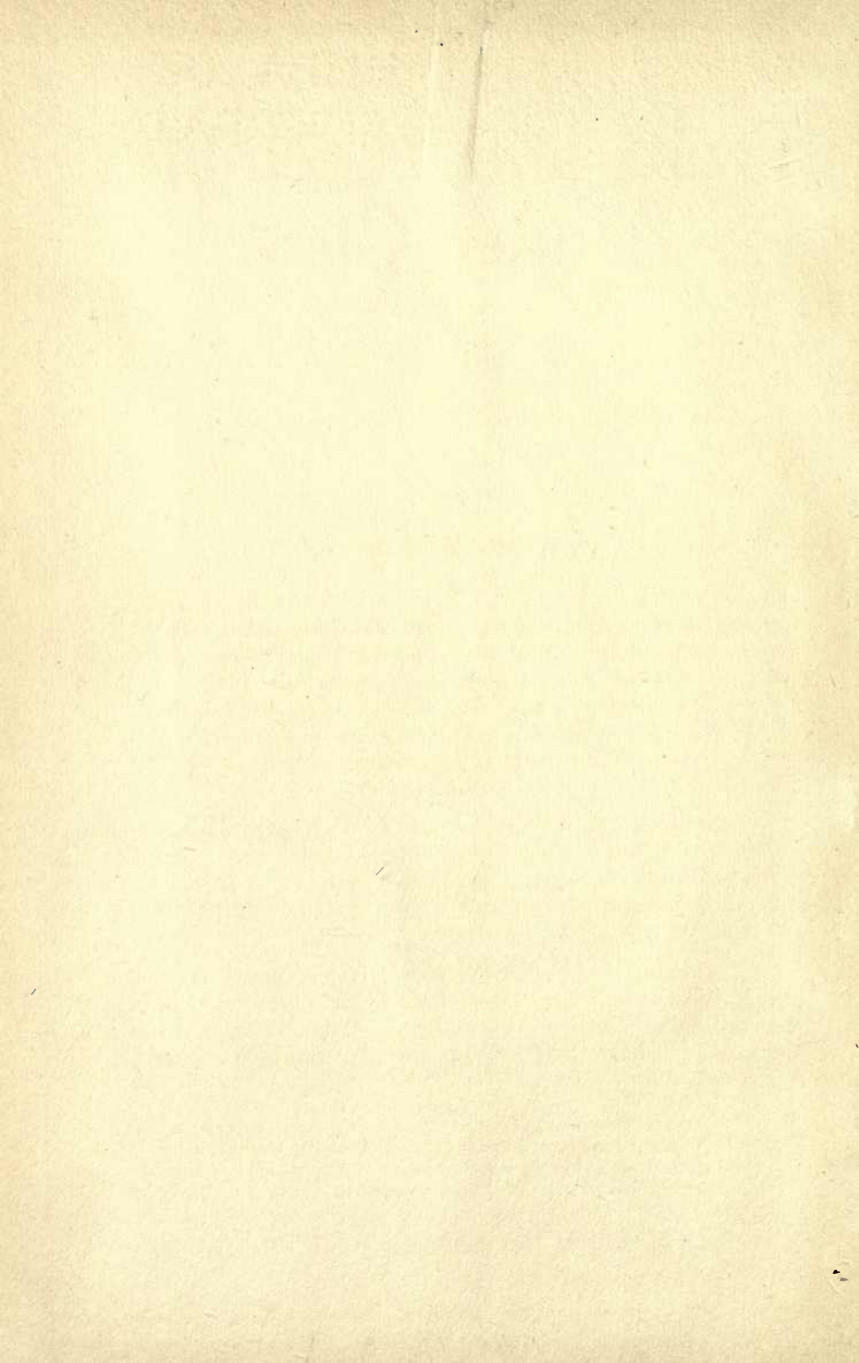
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TO THE MEMORY

of

David John Hughes, Edward Horton, George Kains,
Charles Roe, Jehiel Mann, Samuel Eccles, James
McAdam, Edward Ermatinger, George Scott and
Samuel Day, whose home plantings added flavor,
zest and adventure to my boyhood days and helped
not a little to mold my appreciation of fruits of
high merit



Honestly ! Don't you wish this fruit-
ful arbor was just outside your dining
room door ?

"Fine fruit is the most perfect union of the useful and the beautiful that the earth knows. Trees full of soft foliage; blossoms fresh with spring beauty; and, finally,—fruit, rich, bloom-dusted, melting and luscious,—such are the treasures of the orchard and the garden, temptingly offered to every land holder in this bright and sunny, though temperate climate."

—DOWNING, *Fruits and Fruit Trees of America*.

HOME FRUIT GROWER

M. G. KAINS

NEW YORK

A. T. DE LA MARE COMPANY, INC.

1918

"It is much to be desired that the fruit-garden shall return to the men's minds, with its personal appeal and its collections of many choice varieties, even the names of which are now unknown to the fruit-loving public. The discriminating admiration of fruits for odor, good form, and color, and for choice quality is unknown among us today. * * * The commercial market ideals have come to be controlling, and most fruit eaters have never eaten a first-class apple, or pear or peach, and do not know what such fruits are: * * * All this is as much to be deplored as a loss of standards of excellence in literature or music, for it is an expression of lack of resources and a failure of sensitiveness."

—L. H. BAILEY, *Principles of Fruit Growing*.

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PREFACE

IN writing this book my aim has been to enhance the home production of fine fruit and thereby foster better living. As the text clearly shows, I have herein consistently ruled against commercial standards and practices, whenever these fall below the high order of merit and quality set by the amateur. The commercial grower produces fruit for a livelihood, to supply the demands of people who do not grow it; the amateur grows it for the joy of achievement, for the realization of a high ideal. In the one case the fruit is the means to an end; in the other, it is the end itself. Both men are needed in our national economy, but of the two, as shown in chapter 13, the amateur from the beginning has played, and should continue to play, the title role because he, rather than the commercial grower, sets the standard of excellence.

Such being the case, effort has been made to depict the pleasure of growing—and eating—fine fruits and, by means of photo-engravings, to portray the restful and the refining influences of home fruit growing. These pictures which present glimpses of home plantations, such as those in which my boyhood and young manhood were spent, reveal happy blendings of beauty and utility and should, therefore, prove suggestive and helpful to the dweller on the city and suburban lot, the owner of a “country place,” and the farmer who aims to give an air of refinement and *hominess* to his residence, without belittling utility and economy.

As beginners are often bewildered by descriptions of varieties in nurserymen's catalogs, as they may know little as to the kind of nursery stock to order, and are frequently at sea as to how to make a selection, especially if they read literature based upon commercial standards, I have rather fully discussed the main points to consider in choosing varieties and buying plants for the home plantation. The primary aim should be for high quality, for as Downing points out, “He who owns a rood of proper land in this country, and, in the face of all the pomonal riches of the day, raises only Crabs and Choke-Pears, deserves to lose the respect of all sensible men.”

The great majority of the Northern tree fruits discussed herein, I have learned to know well in Canada, (my boyhood home), Ohio,

Michigan, Illinois, New York, New Jersey, Delaware, Maryland, Virginia, West Virginia, Pennsylvania and Massachusetts, in all of which sections I have either resided or spent much time with fruit growers. Since my travels in sub-tropical regions have been limited I have been obliged to draw on the experience and opinions of other fruit growers for judgments and descriptions of such fruits and fruit varieties.

Doubtless the majority of my readers, having small areas at their disposal, need suggestions as to the maximum utilization of available space. They should, therefore, be pleased with the chapters on Laying Out the Plantation, upon Combining Beauty with Comfort and Utility, and upon Dwarf Fruits, also with the ample directions for growing the various Bush Fruits.

I can scarcely urge too strongly that each reader plant at least some of the unusual fruits and fruit-bearing ornamentals, for the novelty and variety of the thing. In this connection special attention may be directed to the few paragraphs on origination of new varieties (see Contents), because at least some of these fruits should prove highly interesting as subjects with which to experiment. Plant breeding, however, is in itself a subject for a far larger volume than this one and can only be mentioned as the most interesting and absorbing field of all horticultural effort.

As the American Pomological Society is several times referred to in the text, a few words concerning it may well be said. This association was established in 1848 by broad-minded amateur fruit growers whose aim, according to the Society's constitution, is "the advancement of the science of pomology." In this work the Society has won an enviable standing in the world, because, to quote from the last address of Hon. Marshall P. Wilder, (for nearly forty years its president), "it has raised the standard of excellence by which our fruits are judged, discouraged the cultivation of inferior sorts—educated the taste of the public for those of better quality—established a uniform system of rules by which fruits are to be shown and judged—instituted a much needed reform in the nomenclature of fruits—published biennially its *Catalogue of Fruits*—but most important of all [its constant aim has been] to give American Pomology a high character

as a science, [and] to maintain a position of dignity, integrity and impartial usefulness."

Every fruit grower, whether professional or amateur, should be a member of this great Society, which in return for his small membership fee will not only accord him the usual privileges of membership and provide him with a bound copy of the "Proceedings," but will present opportunities for inspiration unequalled by any other horticultural institution of the Western Continent.

My special thanks are due to *The Garden Magazine* for permission to quote Mr. Stephen F. Hamblin's article on "Beauty, Comfort and Utility" (page 21); to *The Country Gentleman* and to Prof. W. N. Hutt for the article on "Home Orchards in the South" (page 41); to both of these magazines, to *House and Garden*, to the United States Department of Agriculture, to several State Experiment Stations, to the Van Dusen Nurseries of Geneva, N. Y., and to individuals for the use of photographs separately listed under "Acknowledgments." After the diagram on page 34 was made for this volume, I used it in more graphic form in an article, written specially for *The Garden Magazine* of April, 1918.

The writing of this book, my sixth on a horticultural subject, has given me especial pleasure because, while talking of fruit growing, it has afforded me an opportunity to delineate from intimate association an ideal of home life peculiarly suited to American conditions and to the temperament of our people whatever their station may be.

Experiences as parent and foster parent in presenting previous "brain children" to the world have shown me that no matter how fond and careful we may be the neighbors are always able to find flaws in our "perfect" offspring. Unlike doting fathers and mothers, however, I shall be glad to have these shortcomings and errors called to my attention so they may be rectified.

M. G. KAINS

Port Washington, N. Y.

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Choosing Varieties

Points to Consider—Precocity—Prolificacy—Annual or
Biennial Bearing—Duration—Number of Kinds—
Pollination

AS a man is judged by the company he keeps, so a fruit grower is rated by the kind of fruit he grows. I therefore warn would-be planters to avoid varieties of low quality, for "evil communications corrupt good manners." As the family plantation is an expression of the family taste my first ruling will always be against Ben Davis Apple, Kieffer Pear, Elberta Peach, Lombard Plum, Concord Grape and other varieties of their rank, because so many kinds are superior to them in quality. Beautiful looking many of them certainly are, much more attractive in appearance than many of the really superlative varieties; but handsome is as handsome does. Better disappoint the eye than deceive the palate! They are all standard market varieties, so it is always easy to get them; for "the poor are always with us." Besides, who wants to be always apologizing either to his palate or to his friends for growing inferior fruit? I would rather have my guest, as well as my family, eat to repletion and then follow the receding fruit basket with their eyes, than have them leave even the small part of a cluster of Grapes on their plates or surreptitiously drop a bitten but inedible fruit in the nearest hedge.

Like Eugene Field, the general public likes "any color, so long as it's red." That is because most people "eat with their eyes." Yet here again handsome is as handsome does; some of the choicest varieties have poorly colored skins. Prof. Bailey once characterized the Swaar Apple as a "jaundiced looking thing," but I happen to know it is his favorite Apple—one of the very choicest.

In making a choice of varieties for the limited space that a home fruit plantation must occupy I would next discard other varieties likely to be on sale in my local market. Next cut out cooking kinds because substitutes for them can easily be purchased. So far as Apples are concerned the balance of the Winter varieties I would next pass by for the same reason. Late Autumn varieties of Apples would follow, so that I would gradually narrow down to Summer and early Autumn Apple varieties and the more perishable high quality fruits rarely offered for sale—Strawberries, Raspberries, Blackberries, Peaches, Plums, Cherries. Grapes and Pears for cold sections; Loquats,



Fig. 1.—For pure delight does any other place, except a barn, compare with an orchard?

Figs, Kakis, and other choice sub-tropical fruits for the South and California.

My reasons are that these are less easy to procure than standard market sorts in prime condition; they are much more perishable than market kinds; they usually have longer periods of ripening, though after once reaching maturity they usually deteriorate quickly and in the case of tree fruits when properly managed they are more likely to bear every year. This last remark applies specially to Summer Apples because these have more time between harvest and the close of the season in which to develop fruit buds for the following year's crop. Personally I think it is a mistake to choose varieties like Tompkins King and Grimes Apples, which are notorious for tree weakness, for though such troubles may be in part prevented, why not avoid the fuss and possible failure by choosing varieties of known health and sturdiness? As to extra susceptibility to disease of the fruit itself, if one is willing to devote the extra attention to spraying it may be worth while to include them. I certainly would in my own orchard, because many of these varieties are of superior excellence.

"Shy," or not very abundant bearing, doesn't always mean as much as the term seems to imply. It is generally employed in a commercial sense. For instance, one large tree of Swazie, seventy-five years old, yielded an average of only four barrels each alternate year. From a business standpoint, even at highest prices, such a tree would yield fewer dollars during a term of years than a Ben Davis tree whose fruit always sells at a far lower price. But left to the judgment of the palate the Swazie would pay a far larger dividend of gustatory thrills. Other things being equal it will be natural to pick out the varieties that bear abundantly rather than sparsely, even though no thought of profit is to be considered; for can one have too much of a good thing? Whether the fruit drops readily or hangs tenaciously is less important to consider from the home standpoint than from that of the market. Varieties which drop seriously must be picked before those which cling well.

Many varieties especially of Apples and Pears seem determined to bear large crops one year and little or nothing the next. To some extent this is dependent upon the positions of the fruit buds; trees which bear their blossoms on the tips of twigs or spurs are prone to biennial bearing, whereas those which have axillary buds (upon the sides of the branches) are more likely to bear annually. By judicious thinning of either the buds, the fruit or both the former may be educated to bear a partial crop annually. One man of my acquaintance has thus taught his Baldwin trees to yield profitable crops each year. They have failed only twice in over twenty years—and then only

because of frost at blossoming time! If a commercial grower can do this with such a notorious biennial cropper as the Baldwin, why cannot an amateur?

Thinning the fruit is indicated wherever the amount that sets after flowering is greater than the tree can carry to perfection. It will also save much breakage of branches of trees whose wood is brittle and, when loaded, easily broken by the wind.

Acid varieties are almost invariably better culinary fruits than sweet, mild or "sub-acid" ones. This is because the process of cooking destroys some of the acid, as well as drives more or less of the volatile oils off into the air. Cooking slowly at lowest possible temperatures and in covered vessels with little or no water added will retain a larger part of these flavors and acids than will reverse methods. By cooking skins and all—except the resident entomology—a still larger part may be retained. The skins may be eliminated by using a colander.

Many varieties are said to be short-lived. This is a relative term. "Short-lived" Apple trees may bear good crops for 25 to 40 years; long-lived ones 75 to 100 years or even more. Peaches are considered almost unbelievably old at 25 or 30 years because the usual commercial age is a third of this.

Some varieties of tree fruits are noted for beginning to bear while very young, even the second or third year from planting the trees. Such being the case it is a very good plan to include several of these precocious varieties in the family orchard, so as to encourage oneself by the sight and the taste of home-grown fruits. They will thus offset the patience that often must be stretched almost to the breaking point by varieties that are slow to reach bearing age but which because of their sterling worth should always be included in every amateur orchard large enough to allow them to be included. He was a wise man who when planting his orchard designated a certain tree for each of his children. The two oldest children—seven and five years respectively—were given the quickest maturing varieties, the other two—three and one—not being able to understand, were given slower growing ones.

Some varieties, especially of Winter Apples, seem to ripen their fruit almost all at once, others during several (Primate often from five to eight) weeks. By gathering the mature specimens in two, three or more pickings those left on the tree will improve in size, color and quality. If commercial growers find two or three pickings profitable, the home grower should find it still more advantageous.

Since the season of ripening varies widely with locality—Northern Winter Apples such as Northern Spy being Fall Apples in the South

and Southern Winter varieties being impossible to ripen in the North—I have usually taken the Southern Hudson Valley as a guide in stating time of reaching maturity and continuing in season. Such varieties as Winesap and Grimes, Apples grown more largely in other sections, are estimated according to their season in those sections.

The length of time that fruit may be kept in prime condition whether in home or commercial cold storage varies with every variety and with such factors as soil, season, time of gathering, way handled after picking, manner and character of storage. These vary so much that they must be learned only by personal experience. And yet certain varieties, for instance, Red Canada Apple, are noted for peculiarities such as shrivelling, due probably to thin or unusually porous skins. This they seem determined to do in spite of every precaution to prevent it. Therefore they should be eaten or cooked before they begin to lose their crispness and juiciness.

Long-keeping quality, while less important commercially than before the advent of cold storage, is from the home storage standpoint as important as ever, especially in the case of Grapes, Pears and Apples, which by proper choice of varieties may be made to keep under home storage conditions till Easter or later.

As far as possible in estimating the value of a variety from the home standpoint, I have endeavored to rely upon my own personal experience, observation, and knowledge of each variety, rather than to follow the opinions of others, because the reader will in this way have a definite—not necessarily a better—standard with which to make comparisons.

Doubtless many more varieties should be included in the various lists, but I have felt it safer to mention only those of well-established reputation. In every section the popular varieties include several to many not grown or known elsewhere. Among these it will be well to choose freely because they are already of proved local worth. In fact, it is a safe rule when making up a list to discover by local inquiries what kinds succeed best and what ones fail before deciding finally upon which ones to plant. Failures will thus be avoided to a large extent.

How many varieties to plant must naturally be determined by such considerations as the area available for planting, the size of the family, the fondness of the household for fresh and preserved fruit, the quantity to be given to friends, and so on. In a general way it is best to choose enough varieties to make a continuous succession of dessert and cooking fruit from earliest to latest. For instance, one early, one mid-season and one late variety of Strawberry, Red Raspberry, Black Raspberry, Currant and Gooseberry, should

cover the season for each of these fruits and also the whole season of "small fruits." Fall-bearing varieties should be planted in addition. Three sweet and three sour Cherry varieties—early, mid and late—will perhaps answer similarly, though many people would want four to six or even more kinds of Sweet Cherries. With Peaches there should be one variety for each week from Midsummer to mid-Fall—say ten or twelve kinds. Pears, which begin to ripen with the early Peaches, may be counted as averaging two weeks to a variety for the early ones—those that ripen before Thanksgiving Day—and a month or more for the later ones when properly handled. How many? From August to November, inclusive, eight or ten; from December to March, four. Apples? Well, think of ten months of ripe ones and the 197 ways of cooking and preserving them and draw the line if you can! I should want one variety for each week from Midsummer to mid-Autumn (ten or twelve), one for each two weeks from then until Midwinter (six or eight), and one a month until late Spring (three or four), a total of only about twenty varieties of Apples.

Among the numerous varieties of fruits—several thousand in the cases of Apples and Strawberries, hundreds of Grapes, Peaches, Plums, etc.—grown in America, those characterized in the lists which follow are specially desirable for family plantations, most of them because of their dessert qualities, many for their culinary attributes and some for "general purposes"; that is, both dessert and cooking.

The names used are for the most part those officially recognized by the American Pomological Society. In some instances these names differ from the popular name, which, however, is almost always evident. For instance, "Greening" is a term loosely applied to several score of green Apple varieties which vary greatly in form, color, and especially flavor. Some of these are worthless when compared with Rhode Island, which is the best-known green Apple and the one everyone really seeks when he buys "Greenings" in the market.

POLLINATION

In old-time family orchards when a Pear or a Plum tree or a Grape vine bloomed profusely but failed to set fruit, the cause was believed to be unfavorable weather, especially cold and rain, during or immediately following blossoming time. Unquestionably this is one of the most common reasons why little or no fruit is borne in certain seasons, so except as modern methods may prove effective in preventing injuries due to cold and even frost the failures are unavoidable.

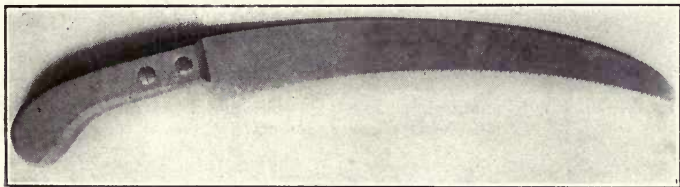
There are, however, other causes of failure rarely observed in family orchards but important enough even there to be considered.

They were not discovered until large commercial plantings failed year after year in spite of full blooming and favorable weather while the trees were in flower. It was found that the failures occurred where one variety was grown in a large block by itself, where the varieties though growing near together bloomed at different times, where the pistils of the flowers were defective, where the pollen was impotent upon the pistils of flowers of the same variety—in short, it was due to self-sterility.

Naturally this discovery has wrought great changes in the commercial planting, especially of Pears, Plums, Kakis, Grapes and less prominently of other tree fruits. Only the uninformed now plant business orchards regardless of these discoveries. Commercial orchardists are more and more particular to choose self-fertile varieties, varieties that bloom simultaneously, that have perfect pistils and potent pollen so as to insure profitable settings of fruit. In family orchards the chances of good settings of fruit increase as the number of varieties increase. This plan not only tends to insure good exchange of pollen but to offset the possibility of inter-sterility—impotency of certain varieties upon each other.

As varieties differ more or less in their behavior and time of blooming in various parts of the country no satisfactory table can be compiled without being unwieldly. To be on the safe side—the tables of blooming dates, sterility, etc., published by the agricultural experiment stations and the United States Department of Agriculture should be consulted prior to ordering nursery stock. It may be said that the European are apparently the only Plum varieties that may be planted in blocks of a single kind with practical certainty of success. Japanese varieties are much less certain and American still less. If these are to be grown trees of several varieties of their group should be planted near-by. So also of other fruits.

In case trees of a single variety or inter-sterile varieties have been planted failures may be averted by grafting or budding properly chosen varieties upon the trees so the proportion will be one to three or four as a maximum.



For draw cutting many people like the Virginian pruning saw



Fig. 2.—What a temptation the Sweet Cherries will be in early July! But what a lovely sight now!

Beauty, Comfort and Utility

Successful Example of Combination — Ornamental Use of Fruit-Bearing Plants—Vegetables Used Unobtrusively

A WELL described, concrete example of success is so much better than theoretical discussion of the same points that I had decided not to theorize on the planning of a small garden, but to describe how a suburban friend combined beauty and comfort with utility in her garden, my own plantation not being enough advanced to boast of prowess. But along came the *Garden Magazine* with an article by Stephen F. Hamblin on this very subject. As Mr. Hamblin's garden reveals points which my friend's slightly smaller garden (75 x 200 feet) does not, and as it shows admirably how a small area may be made effective as a source of pleasure and economy, I quote it, by permission of the *Garden Magazine*, with only slight condensations and omissions. My own comments are placed in brackets:

"While we make use of the soil about our house for every food crop that we can grow, can we not still retain in large measure the beauty with which we wish it surrounded? Can-not Beans, Peas, Rhubarb and Plums, while they occupy the ground formerly given wholly to ornamental herbs, shrubs and trees, still give us really the same effects? Though supremely useful, may not our plantations be also beautiful? I think so; and with this idea in mind the present lot planting has actually been worked out.

As will be seen from the plan (Fig. 4), the lot is larger (75 x 220 feet) than one usually finds in the suburbs, but even with the small 50 x 100 foot lot the same general scheme may be carried out. The

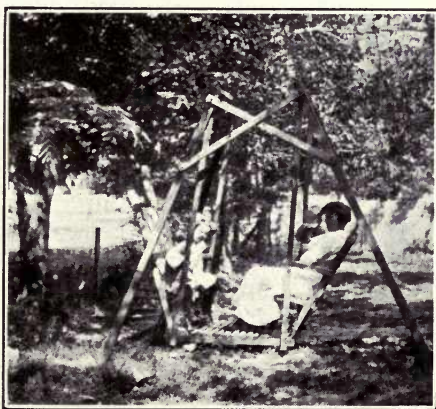


Fig. 3.—In the shade of the old Apple tree

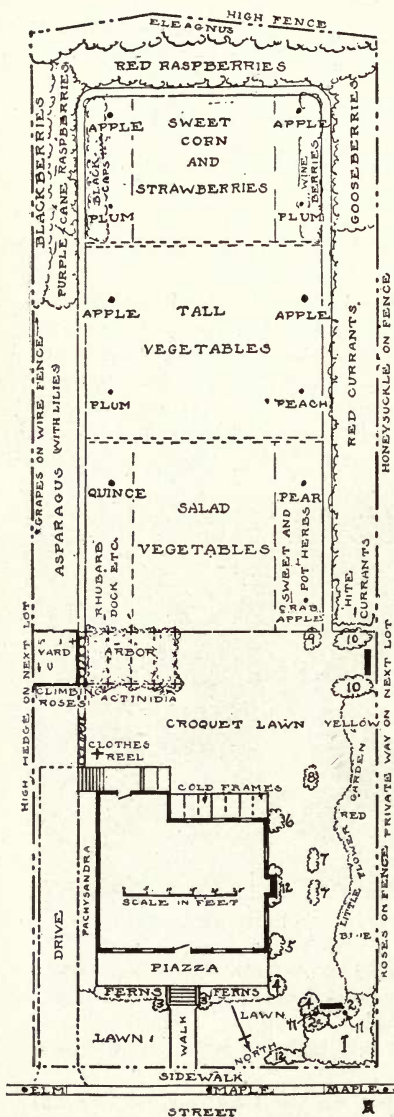


Fig. 4.—This is the lot actually described by Mr. Hamblin. It is a real beauty and utility garden in the best sense of the words

soil is very fertile and will yield heavily with intensive cultivation.

There are no shade trees on the lot, and none will be planted, as those on the street and on the next lot to the east give the lawn sufficient shade, while the land south of the house is to be wholly open to the sun for the sake of the crops. A high Spruce hedge on the east lot line shades a part of the garden from the morning sun, so here a wire trellis bears a crop of Grapes for the table and preserving.

The rear of the lot is bounded by the high wire fence of the athletic field. As excellent views are to be had from the house in this direction only a six-foot screen is desirable. For fruit, as well as flowers and screen of foliage, I vote for the Goumi [page 135]

The lot on the west has not been developed, but as the boys make it a way to the athletic field it will be well to protect the garden. The cheapest garden fence is six-foot woven wire covered with Hall's Honeysuckle. If clipped after the blooming season, a very neat hedge results. For variety a few plants of the new *Lonicera Henryi* may be added. While its purplish flowers are not as attractive as the white of Hall's, the foliage is practically evergreen; the habit of growth is identical.

As the house is set rather near the street the lawn area is small, but back of the house enough is saved for the children

to play croquet, and a summerhouse will give shade and fruit from the Grape vines, while Rambler Roses add flowers. Instead of Grapes I want to grow *Actinidia arguta* for its fruit, if I can get cuttings from a fruiting plant, for not all vines are fruit-bearing. The fruit is green, like a stoneless Plum, and the taste for it must be acquired as for Olives. When cooked it gives a new preserve.

A compost pile (screened by the vines) saves greatly in the item of fertilizer. Into this go all the lawn clippings, leaves raked from the lawn, all vegetable refuse from the kitchen and garden, and when



Fig. 5.—Fruit trees blend well with ornamental planting, especially when in blossom

mixed with soil it gets ready for the next season's planting. On the south foundation wall of the house there is a coldframe of six sash, and a shady section for Winter storage. By using double-glass and heat from the basement through windows in the cellar wall, Lettuce and such green salads can be grown all Winter with little care, and seeds started for early garden planting—no fuss with manure or heating-pipes.

The greater part of the lot is vegetable garden. It is arranged first of all to make plowing of the central panel easy, with little area

to be dug over annually with the spade. The walk is permanent, of clean cinders, dry and weedless. It should be used to avoid walking on the plowed soil. The strip between the walk and the fences will not be plowed as there is not room to turn the horses; so it is filled with permanent plants as a boundary planting, but instead of flowering shrubs and herbs we have Asparagus, Blackberries, Raspberries, Currants and Gooseberries.

This lot is large enough for a few fruit trees, and fruits are fully as valuable a home product as vegetables. The trees also give height, shade, interest and accent to the garden, just as purely ornamental trees will do, flowers in Spring, and most useful fruit in Summer and Fall. The choice of varieties is a personal affair, and must be modified for each section of our country. For home use I have planted one Bartlett Pear, one Transcendent Crab, one Crawford Early Peach, and one Orange Quince—these four more for the preserves than the fresh fruit—and three Japanese Plums (Red June, Abundance and Satsuma for succession) to be eaten from the tree; for I don't care for cooked Plums. One of the Plums might be a Sweet Cherry, but the tree will get too big, and I can get more fruit in proportion from a Plum.

For fresh fruit the year round I depend upon four Apple trees, placed 40 feet apart, the other trees being used as fillers. The Apple trees may shade too much of the garden some day, but perhaps Onions and Potatoes will be cheaper by then. I want Apples every month, so I got four young Baldwin trees and grafted upon *each* a branch of an early, a mid-season and a late variety, getting the scions from orchards in the town. One tree is thus equally Williams Favorite, Gravenstein, Roxbury Russett and Baldwin; the second, Yellow Transparent, McIntosh Red, Yellow Bellflower, and Baldwin; the third, Golden Sweet, Porter, Tolman Sweet and Baldwin; and the fourth, Red Astrachan, Snow, Wealthy and Baldwin. Thus I shall be certain to have plenty of Apples each year, though each variety bear heavily but every third year, and no season shall I get such loads of fruit that a large part is wasted. [This idea is a very practical one and not only for Apples, but for other tree fruits.]

Around the walk on its inner side, as it is not easy to plow close to the fruit trees, there are strips of perennial salad and sweet herbs—Rhubarb, Curly Dock, Horseradish, Dandelion, Lovage, Sage, Thyme, etc.—and the more temporary bush fruits, as Blackcap Raspberries and Wineberries.

The true vegetable area is in three parts, to be plowed lengthwise, the rows running north and south. The area farthest from the house is given to Strawberries, a good early and a late sort, with a

row of an everbearing kind. Each year one-fourth the area is rotated with Sweet Corn; and after the second season's picking the berries are followed by Winter Turnips, or other late maturing vegetable. Thus in each strip four crops are produced in four years:—(1) no crop from the young Strawberry plants; (2) heavy berry crop; (3) fair berry crop and late Turnips; (4) Sweet Corn.

The middle area is devoted to the larger vegetables—Peas, Beans (pole and dwarf), Tomatoes, Potatoes, Squash, etc., as the family wishes. I find that Pole Beans give a greater yield to the square yard than do Bush Beans, so to avoid the nuisance of yearly poles I put them on two strips of woven wire, as I would Sweet Peas, and make a vista down the center of the garden. Melons and Cucumbers

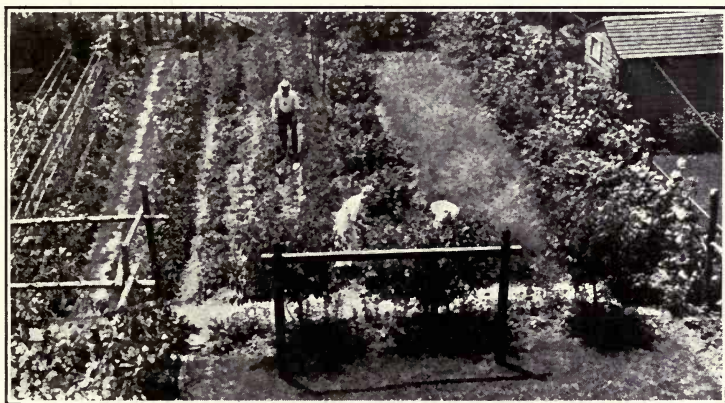


Fig. 6.—Aeroplane view of a suburban garden where Grapes, bush and tree fruits vie with vegetables and flowers in ministering to family needs

occupy too much ground in proportion to their food value, and are frequently omitted.

The area near the house furnishes the salad and small root crops, as Radishes, Lettuce, Beets, Onions, Carrots, Cauliflower, Cabbage, Kohlrabi, Spinach, Chard, Parsley, etc.; some of the rows yield a succession of crops. The last sowings go into the coldframe for Winter. As these all have ornamental foliage some of the effects of formal bedding can be gotten in the blues and purples of Cabbage and Beet, yellows of Chard, gray blue of Onion, and the contrast of feathery Carrots with the broad leaves of Lettuce. Try your kitchen herbs by themselves in a definite scheme, and you will admit that they may rival *Coleus* and associates for interest to the eye, while they interest the stomach.

There will still be room for a few plants whose sole use is their beauty, even in this utilitarian garden. I have chosen about a dozen shrubs, each for some special merit and placed for some specific purpose. Little garden pictures are framed from the living-room, and the street, so strangers need not know that behind the house all is dedicated to our food supply. To hide the little flower garden from the direct view from the street I find fragrant Honeysuckle (*Lonicera fragrantissima*), a shrub with nearly evergreen foliage, effective for this latitude. The early fragrant blossoms are a second distinction. With it are low plants of the shrubby evergreen Bittersweet (*Euonymus radicans vegeta*). This forms a big vine on the big outside chimney. When loaded with fruit in Winter it rivals the classic Holly.

A red and a white Weigela give flower masses in June and heavy foliage to late Autumn. An arching shrub emphasizes two corners of the house. The view to the flower garden from the street in June is framed by a mass of Deutzia. The flower garden is partly separated from the lawn by a few flowering shrubs. For hybrid Roses I have two big rugosa hybrids, and hope to cut big Tea Roses from them all Summer. They will stand six feet high. The Korean Viburnum (*Viburnum Carlesii*) I love as Trailing Arbutus grown to a large shrub. Partly to shade one seat I have a pair of Rouen Lilacs (*Syringa chinensis*), red and white, the most graceful of the whole group, and over the other seat a white and a dark purple common Lilac trained high. In this way I finally chose the following flowering shrubs (numbers on the left refer to the plan; those on the right to the numbers of specimens):

1. Fragrant Honeysuckle (*Lonicera fragrantissima*)—4
2. White Weigela (*Diervilla hybrida candida*)—1.
- 2a. Red Weigela (*Diervilla hybrida*, Eva Rathke)—1.
3. Pink slender Deutzia (*Deutzia rosea*)—2.
4. Lemoine's Deutzia (*Deutzia Lemoinei*)—1.
5. Hybrid Goldenbell (*Forsythia intermedia*)—1.
6. Lemoine's Mock Orange (*Philadelphus Lemoinei*)—1.
7. Double pink (*Rosa rugosa*, Conradi F. Meyer)—2.
Double white (*Rosa rugosa*, Sir Thomas Lipton)—2.
8. Korean Viburnum (*Viburnum Carlesii*)—1.
9. Summer Lilac (*Buddleia Davidii*)—1.
10. White Rouen Lilac (*Syringa chinensis alba*)—1.
Red Rouen Lilac (*Syringa chinensis sangeana*)—1.
11. Charles X. and Marie LeGraye (*Syringa vulgaris*)—2.
12. Shrubby Evergreen Bittersweet (*Euonymus radicans vegeta*)—8.

The little flower garden is another admission that my make-up demands more than food supply about the home. Again I am restricted in area and in choice, so I have selected about 25 of the best perennials for the permanent hardy border, from 5 to 10 of each. This is the character of the test: 1, Absolute hardiness at all times; 2, Long life without annual shifting; 3, Resistance to drought and disease; 4, Ease of culture; 5, Non-spreading roots; 6, Free and long-con-

tinued bloom; 7, Pleasing colors in showy flowers; 8, Value as cut flowers.

I make three great groupings by color, putting reds in the central part, blues toward the street, and yellows at the south end. The pale colors and the white varieties connect the three groups. I have a succession of bloom from first Squills to Autumn Crocus, and a gradation of heights from back to front, thus:

YELLOWS

Late Lemon Lily (*Hermerocallis thunbergii*), 3-4 ft. July.
 Showy Coneflower (*Rudbeckia speciosa*), 2-3 ft. August.
 Yellow German Iris (*Iris flavescens*), 2-3 ft. June.
 Butterfly-weed (*Asclepias tuberosa*), 2 ft. July.
 Lance-leaved Tickseed (*Coreopsis lanceolata*), 2 ft. June-July.
 Dwarf Orange Day Lily (*Hermerocallis dumortieri*), 2 ft. June.
 Orange Globeflower (*Trollius japonicus*), 2 ft. May.
 Gold Dust (*Alyssum saxatile compactum*), 6 in. May.
 Yellow Crocus (*Crocus susianus*), March-April.
 Yellow Cottage Tulips, May.

REDS

Oriental Poppy (*Papaver orientale* in variety), 2-3 ft. June.
 Garden Peony (*Pæonia albiflora* in variety), 3 ft. June-July.
 Bleeding Heart (*Dicentra spectabilis*), 2 ft. May-June.
 Gas-plant (*Dictamnus albus* in variety), 3 ft. June.
 Garden Phlox (*Phlox paniculata* in variety), 2-3 ft. July-August.
 Miss Lingard (*Phlox suffruticosa*), 2-3 ft. June-July.
 Mountain Phlox (*Phlox ovata*), 1 ft. June.
 Scotch Pinks (*Dianthus plumarius* in variety), 6-12 in. June.
 Moss Pink (*Phlox subulata* in variety), 6 in. May-June.
 Giant Snowdrops (*Galanthus Elwesii*), March.
 Tulipa pulchella, *T. linifolia*, *T. greigii*, *T. sprengeri*, etc. May-June.

BLUES

Great Blue Flag (*Iris pallida* in variety), 3-4 ft. June.
 Siberian Iris (*Iris sibirica* in variety), 3-4 ft. May-June.
 Bee Larkspur (*Delphinium formosum* in variety), 3-4 ft. June-July.
 Balloon-flower (*Platycodon grandiflorum* in variety), 3 ft. July-August.
 Japanese Speedwell (*Veronica longifolia subsessilis*), 2 ft. August-September.
 Chinese Larkspur (*Delphinium grandiflorum* in variety), 2 ft. June-August.
 Greek Valerian (*Polemonium reptans*), 1 ft. May.
 Chickweed Phlox (*Phlox stellaria*), 6 in. May.
 Scilla in variety, March.
 Autumn Crocus (*Crocus speciosus*), September.
 Darwin Tulips in dark shades. May-June.

The six-foot fence with the Hall's Honeysuckle is but four-feet high back of the flower garden and bears Rambler Roses of the Wichuraiana type—Dorothy Perkins, White Dorothy Perkins, Excelsa, Hiawatha and Evangeline. For Fall bloom, instead of *Clematis paniculata*, I have two plants of Climbing Knotweed (*Polygonum baldschuanicum*), and I shall try the new *P. Aubertii*. These have the Clematis outplayed every way as to beauty and grace, and have a longer season of bloom.

It is certain that little else can be added to the ornamental planting, for the lawn is tiny as it is. But yet plants whose first value is not edibility can be squeezed in here and there. The narrow grass strips along the drive, so shaded that grass will not grow, have been covered with *Pachysandra terminalis* and Lily-of-the-Valley for foliage and flowers, and Squills and Snowdrops shoot up in the Spring. Against the piazza I have ferns, only the Cinnamon and Interrupted ferns (*Osmunda cinnamomea* and *O. Claytoniana*), for these give the greatest foliage to the plant and are permanent as a Peony. With them I have planted light-colored Darwin Tulips.

Lilies, the tall hardy sorts, as *L. tigrinum*, *L. speciosum*, *L. Henryi*, *L. elegans*, *L. superbum*, *L. regale*, *L. Sargentiae*, I am adding to the Asparagus bed to the detriment of neither. Narcissus of all sorts form an irregular row under the Grape trellis; a double row of Gladiolus divides the salad garden. I am now trying to find a few more spots where flowering herbs can go in among the fruits and vegetables without taking up valuable room.

Six window boxes of the self-watering kind are placed on the piazza rail. As they are on the shady side of the house, I have shade-enduring herbs. For main effect there is a very vigorous double-flowered form of red everblooming Begonia. Two boxes of them in the house in Winter fill the six in Summer. The inner side droops in Wandering Jew (*Tradescantia fluminalis*), green and variegated. As it is tender a sufficient stock is carried over Winter in the two boxes of Begonias in the house. The front face is Moneywort (*Lysimachia nummularia*). As this is hardy it is dumped in the vegetable garden in the Fall and divided again for the boxes in the Spring. When I want the boxes different I can use the other Wandering Jew (*Zebrina pendula*) and the Begonia can vary to any of the semperflorens type in pink, rose and white.

For the initial planting of this lot, it would require about fifty dollars, but I obtained many plants by exchange, gift and seed. The yearly cost for seeding and plants is less than five dollars, allowing for a few new vegetables and bulbs each year. For tools I have spade, spading fork, two hoes, wheel hoe and attachments, lawn mower, pruning and grass shears, wheelbarrow and knapsack sprayer. There are other tools I would like, but I make out with the present equipment. As for time, it takes about a day a week during the growing season (an hour or two daily); but for planting and first weeding at least two days a week are required. By keeping the permanent plantings mulched with dry litter and grass clippings, the weeding of many beds is nearly avoided.

This lot gives fruit and vegetables the year round for a family of

five, flowers for the table and the neighbors, and from the street or house windows has its interests and beauties all the year. As an investment it repays in cash a thousand times the yearly outlay in money and time while the intangible returns cannot be shown by measure. Extreme utility and beauty can be combined in the same lot.

With small grounds, such as the 40 x 100 foot lot often available for the suburban dweller, many of these fruits and vegetables must be omitted, and preference given to those that require very little room in proportion to the crop. I prefer that the house should be near the street, and the area between house and street in lawn (Fig. 7). A few fruiting shrubs, as Currants and Gooseberries, may be planted

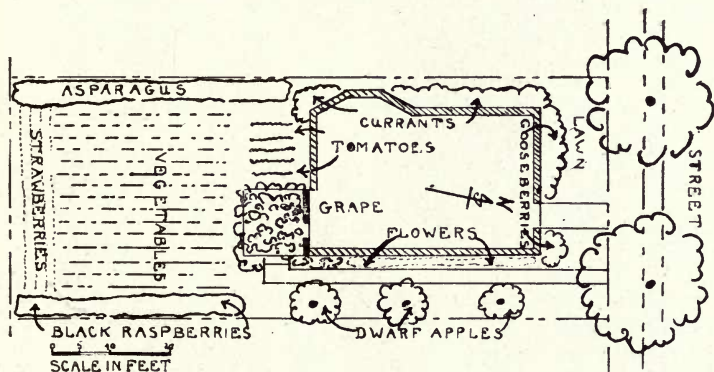


Fig. 7.—Adapting the small lot to a "utility plus beauty" basis of planting. Plenty of flowers for ornament as well as things good to eat

against two sides of the house. Shade will be afforded by the trees on the street. A Grape vine will give shade and fruit over the rear porch, and on a trellis along the east side of the house. Beneath the vine a few Spring bulbs and such enduring herbs as German Iris and Phlox will give a bit of flower garden.

The remaining half of the lot is to be spaded yearly, but the sides and rear are in permanent planting, as Asparagus, Strawberries, Black Raspberries, etc.—not Red Raspberries or Blackberries as they spread underground too much for so small a place. Along the east line three dwarf Apples (early, midseason and late) are all the orchard fruit possible. Tomatoes on trellis or poles may be grown close to the south wall of the house. The 30 x 30 foot central area is planted in north-south rows of salad vegetables, dwarf Beans and Peas, and such other low growing vegetables as the family wishes."

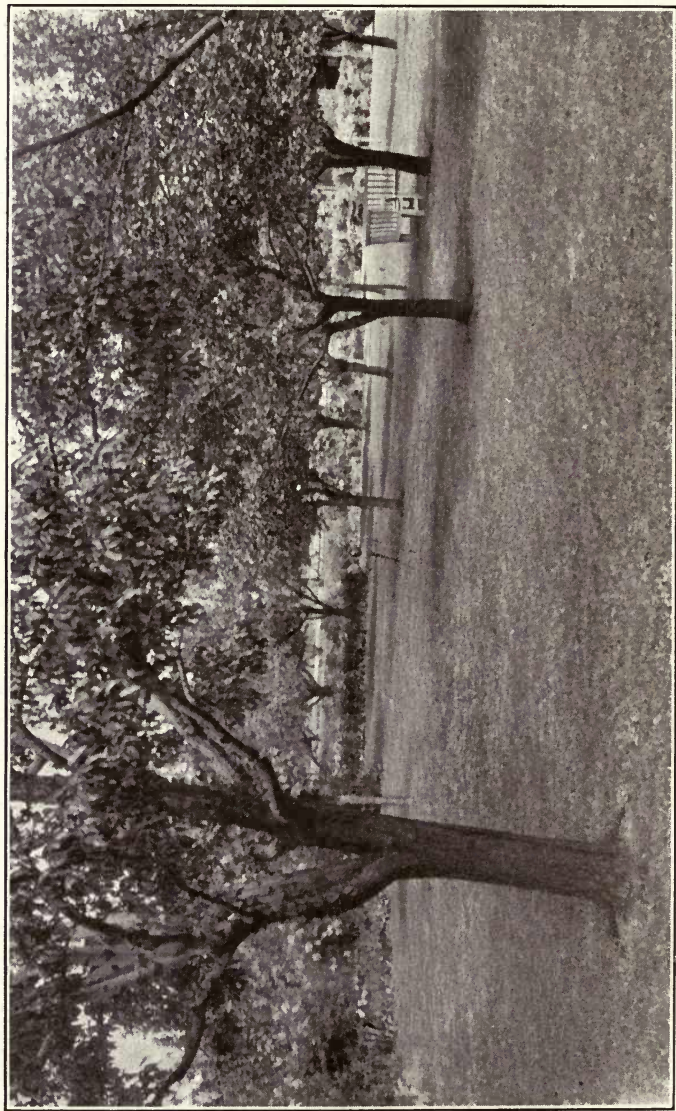


Fig. 8.—Lawns planted with fruit trees were far more popular with our fathers than today. The combination is a happy one because it makes for both beauty and utility

Laying Out the Plantation

How Much Space Do Fruit Plants Need?—Distance Table for
Fruit Planting—Transplanting Requisites

WITH Mr. Hamblin's suggestions in mind as to beauty and utility in limited areas, planning a new plantation becomes an easy matter. As probably no two people would plan their areas exactly alike, and as there are also differences in shade, contour, exposure and other local factors that will influence planning, I shall give only the following suggestions:

On limited areas such as suburban lots, use fruit-bearing instead of mere "ornamental" plants. Many of these are beautiful when in blossom and again when in fruit. The pink blossoms of the Peach, the later white ones of the Cherry and the still later ones of Pear and Apple are particularly pleasing when borne by well-placed specimen trees on lawns large enough to admit of their normal development. In smaller places dwarf trees may easily be used instead.

But suppose that the "orchard fruits" are to be kept in the orchard; there are yet "ornamentals" which will yield a by-product of their beauty. Few shrubs are more striking than the Goumi (page 135). Is not the common Barberry (page 113) attractive alike when golden with its dainty racemes of bloom and again when flaming with scarlet berries which continue beautiful till Midwinter. And is the Viburnum (page 196) any less useful and beautiful? In early Spring what is more lovely than the Shadbush or Juneberry



Fig. 9.—Work the soil well among the roots with the fingers

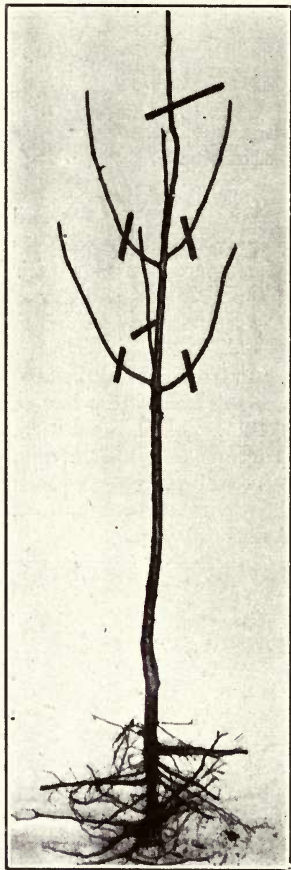


Fig. 10.—Double deck tree but branches too close in each deck

(page 153) arrayed in bridal robes of virgin white amid the bleak setting of lingering water or again when gemmed with purple fruits in the leafy month of June? Japanese Quince (page 152), whether snow-drift white, or maiden blush, or regal scarlet, most splendid of ornamentals, bears odd, inconspicuous but fragrant fruits which will long perfume a large, confined area. Elder bushes (page 127) will convert the back fence corner into a place of beauty and fragrance in early Summer and again in early Autumn. As a hedge, ornamental alike when in bloom or when covered with orange or red berries, the Buffalo-berry (page 118) has few rivals. And for sandy spots where other plants are prone to fail the sand or dwarf Cherry (page 186) has equal claims for recognition.

The fruit of each one of these plants has culinary qualities which alone would make most of them worth growing for a home supply, but which combined with their beauty of flower, their grace of form and their attractiveness when in fruit, makes them rank almost with Raspberries and Blackberries, which, by the way, are beautiful when in blossom but are not as amenable to civilized restrictions as could be desired.

HOW MUCH SPACE DO FRUIT PLANTS NEED?

If the novice could mentally see the full-grown tree or bush when he is planning and planting he would allow far more space than he usually does. But the nursery stock looks so small that the very natural mistake is made of allowing it a half or even a quarter of the space it should be given. The results are spindly, unproductive, early failing trees and bushes—disappointment.

DISTANCE TABLE FOR FRUIT PLANTING

	Feet Each way
Apples, dwarf on Paradise stock.....	8 to 10
Apples, dwarf on Doucin stock.....	12 to 25
Apples, standard, small growing.....	25 to 35
Apples, standard, large growing.....	35 to 50
Apricot, dwarf.....	8 to 10
Apricot, standard.....	15 to 25
Blackberry.....	4 to 8
Blueberry.....	6 to 10
Cherry, standard, sour.....	15 to 20
Cherry, standard, sweet.....	20 to 30
Cherry, dwarf, sour.....	8 to 10
Cherry, dwarf, sweet.....	10 to 15
Currant.....	4 to 6
Fig, in Southeast.....	15 to 25
Fig, in California.....	25 to 40
Gooseberry.....	4 to 6
Grape, large growing.....	10 to 20
Grape, medium and small.....	6 to 10
Kaki.....	20 to 30
Lemon.....	25 to 30
Loquat.....	15 to 25
Mulberry.....	25 to 35
Nectarine, dwarf.....	8 to 10
Nectarine, standard.....	18 to 25
Orange.....	25 to 30
Peach, standard.....	18 to 25
Peach, dwarf.....	8 to 10
Pear, standard.....	20 to 30
Pear, dwarf.....	10 to 15
Plum, standard.....	15 to 25
Plum, dwarf.....	10 to 15
Quince.....	12 to 20
Raspberry, Red.....	4 to 5
Raspberry, Black.....	4 to 6
Strawberry.....	1 to 3



Fig. 11.—The three main branches rather close but the secondary ones much better placed

When planting bush and tree fruits in limited spaces it is not necessary to stick to the exact recommended distances. Probably the most convenient way is to divide the available space upon a unit basis, the unit being the distance to allow between the smallest growing shrubs. Thus Gooseberries may be set four to six feet apart. Four feet is rather close, but if the area won't divide up without waste space this unit may be used. Small growing shrubs may be placed at unit distances between the trees, preferably in rows all running one way, because they will yield several years before the shade becomes too dense and they may be cultivated easiest when so arranged.

The diagram (Fig. 12) will make these points clearer. This area is 48 feet square. At each corner is a standard Apple tree, A;

at the middle of each side is a Peach tree, Pe; in the center of the square a standard Pear, Pr. As shown at D in left, right and center rows, a dwarf tree is placed at the 12- and 36-foot intervals. Dwarf trees are also placed at the 12-foot intervals, D and Pl, between the middle and the outside rows, and also in line with the trees already mentioned, thus forming two rows of dwarf trees 12 feet apart each way. Between the trees in the left hand row are four Currant bushes, C; between those on right, four Gooseberry bushes, G; between those in other tree rows, 12 Black Raspberry bushes, BR. Half way between each pair of tree rows is a continuous row of Red Raspberries, RR, or Blackberries, B—two rows of each, the plants being set four feet apart. If desired one of these Raspberry rows may be Red, the other Purple, and one of the Blackberry rows may be of Dewberries instead.

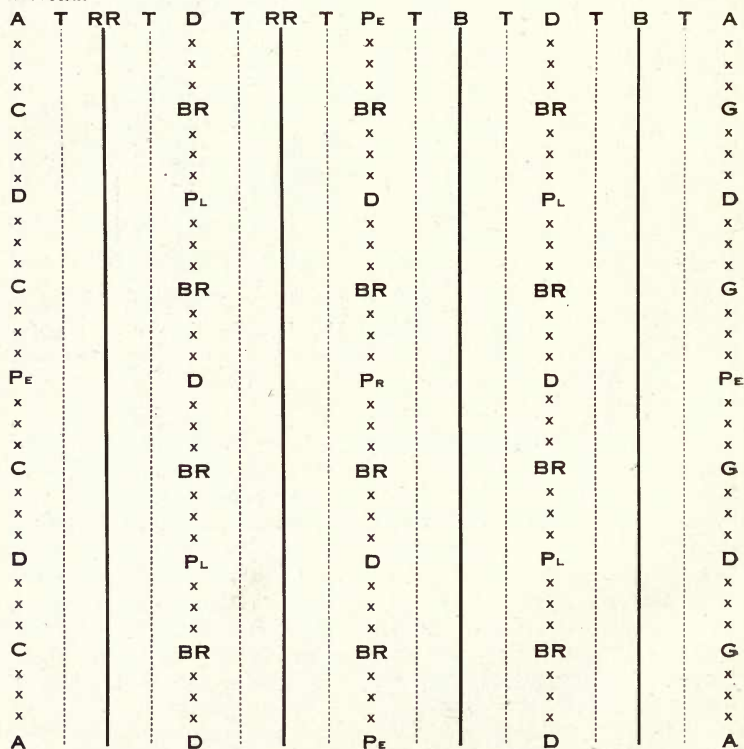


Fig. 12.—Unit of intensively set fruit plantation. Size 48 x 48 feet

Thus we have in this 48-foot area: Four standard Apple trees, one standard Pear, four Plum, 12 dwarf trees of various kinds (Apricot, Peach, Pear, Cherry or Apple); four Currant and four Gooseberry bushes, 12 Black Raspberries and 16 plants each of Red and Purple Raspberries and of Blackberries and Dewberries. There is yet ample space for Strawberries which may be planted 18 inches apart in the tree rows. At this distance three may be set in the six-foot intervals between the trees and bushes—24 plants to each row. These Strawberries if planted in the Spring at the same time as the trees and bushes will yield one good crop the following Summer before the bushes begin to shade them too much. Between each pair of Strawberry plants the first Spring may be placed Lettuce, Onion Sets, Early Radish, Spinach or hills of Beans—any shallow rooting vegetable that quickly matures and is removed before late Summer.

The six-foot strips between the tree and the Raspberry and Blackberry rows may also be planted with Strawberries to be cropped two years, but preferably with truck crops, T, that require the ground to be cultivated more or less until mid-July but not between August

first and October first, because that is the time when woody plants must be allowed to slow down their growth and ripen their tissues to withstand the Winter. The plants to avoid are those such as early Potatoes that must be dug in August or September, because the soil then gets stirred at the wrong time and the trees and shrubs may

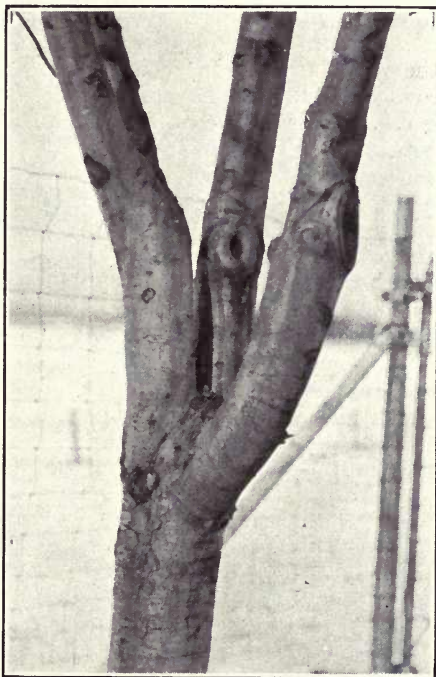


Fig. 13.—Trouble ahead! Three Y crotches all starting from one point. When bearing a heavy fruit crop or loaded with ice a break is inevitable

start to grow again or to continue growth so late they may not ripen their wood before Winter.

The prophesied history of such an area will be about as follows: The vegetables between the Strawberry plants will be gone shortly after Midsummer, those between the tree and Brambleberry rows by Fall. Similar crops may be grown successfully between these rows the second season, but probably not later. After the Strawberries have borne the plants must be destroyed. A partial crop of Raspberries and Blackberries may be secured the first season if transplanted plants are set, but not until the second if tips, suckers and root-cutting plants are set. Currants and

Gooseberries should bear a partial crop the second season. From then until the sixth or eighth all these fruits should bear well, but by

that time the trees will be needing the plant food and the space, so the berry plants must be removed where they are beginning to fail. By the tenth year the trees should have all the space. Some of the dwarf trees may have to be removed between the eighth and the twelfth years where the standard trees are crowding them. Perhaps by the fifteenth year the Peach trees will have failed, so they may be cut out. About the

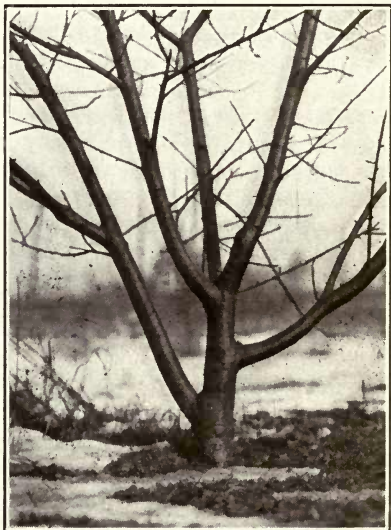


Fig. 14.—Notice the strength of the crotches. Not one of these branches will break because no two pull against each other



Fig. 15.—The folly of allowing several branches to start close together, especially on Plum trees

same time, or perhaps earlier, the plums will have to go. The standard Pear tree may remain until the twentieth year or even longer, the Plum and the Apples for fifty or one hundred years!

TRANSPLANTING REQUISITES

When plants are to be transplanted the following rules will be found helpful:

Prepare the soil well beforehand either by previous cropping or by making it mellow and rich where each tree is to stand.

Avoid mutilating the roots as much as possible.

If dry when received from the nursery soak for a day or two—top as well as root—in water.

Pare away broken and bruised roots before planting.

In digging the holes place the good soil in one pile and the lower or sub-soil in another. When planting, work the good soil among the roots (Fig. 9), press down firmly by tramping hard, and scatter the poor soil on the surface in a circle around the tree.

Plant the trees an inch or not more than two inches deeper than they stood in the nursery as indicated by the different color of the trunk at the ground line.

After planting cut back the top severely, leaving only stubs of branches or only buds where the frame limbs are wanted and removing entirely all twigs where limbs are not wanted. Three to five are enough to leave in any case (Fig. 10).

Make all cuts with a sharp knife close to the trunk or branch so as

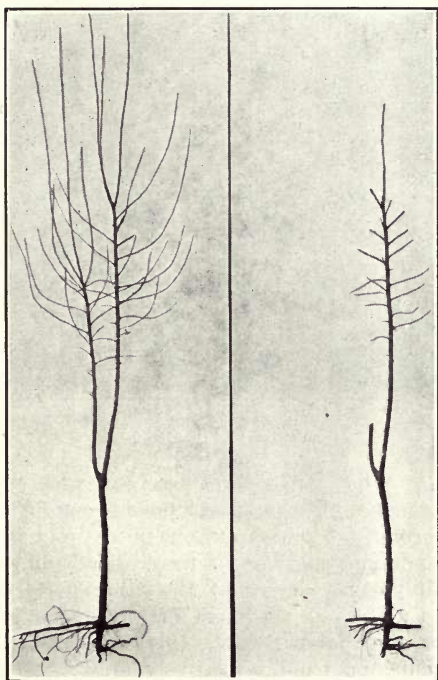


Fig. 16.—When trees come from the nursery with Y branches of equal size cut one back as shown and a year or two later cut off the stub close to the then enlarged trunk



Fig. 17.—A wind-break on the right would have prevented this distortion

When trees are received with two branches of even development and in the form of a Y, either cut one off entirely, or if so doing would leave a large wound and possibly cause drying of the other parts, cut to a stub as shown in Fig. 16 and a year or two later remove this stub when the remaining trunk is relatively larger.

In windy places stake the trees during the first year (Fig. 17).

Never let trees be frozen while out of the ground. This kills them. Bury their roots and part of their trunks if they cannot be planted at once or before frost.

Never place manure or fertilizer in contact with roots. It "burns" and destroys them.

To prevent mouse injury to the trunks during Winter keep the ground bare for at least a yard away and make a mound of

to leave no stub, and not more than a quarter of an inch above the buds from which new shoots are desired.

Avoid having branches start close together (Figs. 11 and 13). Have at least space enough between each pair so the hand may grasp the trunk between them without touching either (Fig. 14). This will prevent splitting of the branches from the trunks in after years when the trees are loaded with fruit or ice (Fig. 15).

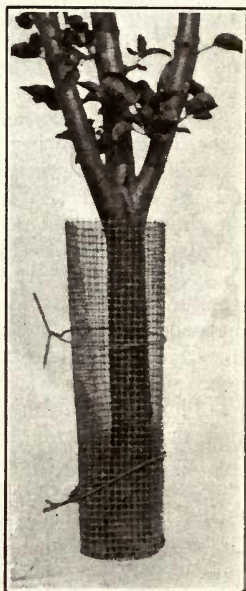


Fig. 18.—Hardware cloth, the surest protection against rabbits and mice



Fig. 19.—Long trunks are undesirable. They are no longer in fashion

trunks and ample space between trees also favor wide spreading and low heading which means less damage by wind (Fig. 11).

Long trunks are undesirable (Fig. 19).

Either before or immediately after the area is planted make a plan showing the variety name and the location of each plant. Then remove every label wire from each specimen, for if a wire or even a string is left it may kill the parts of the tree above, because of a constriction which will form. (Fig. 20).

earth well packed down and about six inches high around each trunk, or use a galvanized hardware cloth or netting protector. If made 24 or more inches high it should prevent rabbit injuries also (Fig. 18).

Never dig deeply near trees unless it is desired to cut off the roots, and never cultivate deeply around bushes for the same reason.

Make the trunks short—6 to 18 inches—to favor pruning, spraying, thinning and gathering the fruit. Short



Fig. 20.—Notice the bulge at the base of the center branch. A copper label wire was left on the first year. Hence the branch blossomed the second season and died the following Winter

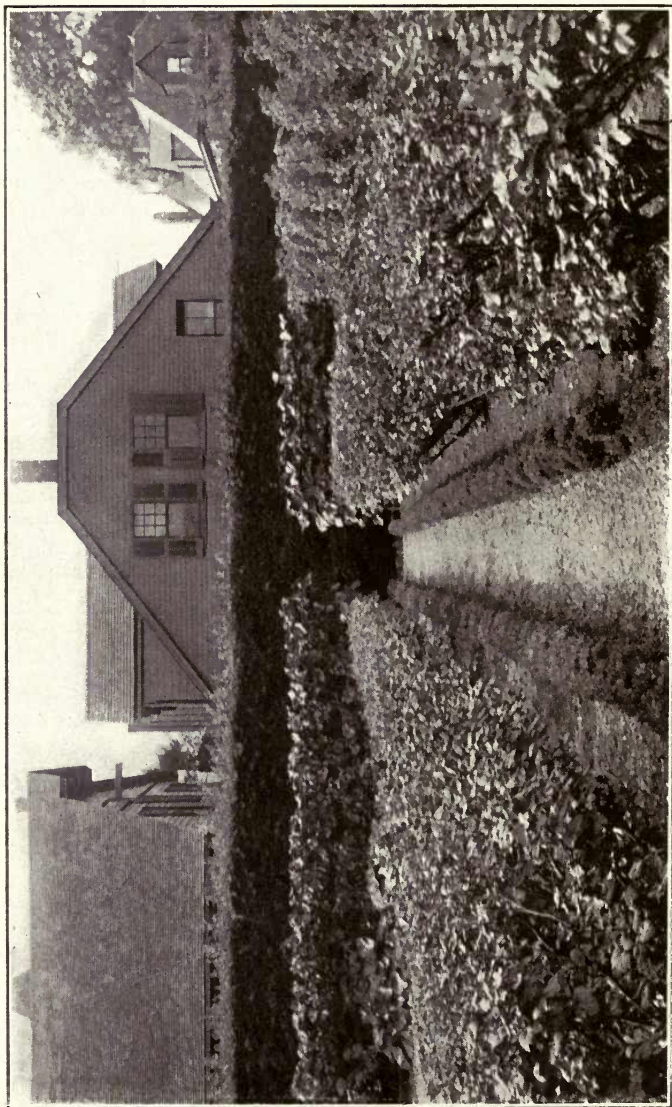


Fig. 21.—Walks bordered with Herbs and Currants or Grape trellises and hedges entice one to wander in the garden during the cool of the day

Home Orchards in the South

Home Orchard for the Coastal Plain Section—
For the Piedmont Region—Varieties Suited to
Each District

“WITH practically every variety of soil, combined with a long growing season, it is possible in the South to have a continuous supply of fresh fruit throughout a large part of the year. Yet most people do without the good things that a home fruit planting would afford, simply because they have never tried it out.” So writes Prof. W. N. Hutt, State Horticulturist of North Carolina, in *The Country Gentleman*, by whose courtesy I am permitted to quote the following paragraphs:

“There is a good deal in the variety question. Experience has shown that while a few varieties may be grown pretty generally over the country most kinds are local and show predilections for certain soils and climatic conditions. These plant preferences have been kept in mind as far as possible in preparing the accompanying fruit lists for the Piedmont and the Coastal regions.

“I have submitted no plan for a home orchard in the mountain regions, as the mountain territory of the South is confined to a relatively small part of a few States. A high altitude in the South assures the same cool climate as a Northern latitude. In places above 2000 feet practically all the Northern classes and varieties of fruit do as well as they do in the Northern States and in Canada. Northern Spy, Wealthy, Spitzenberg and Snow Apples from the high region of the South look as handsome and taste as good as fruit of those varieties grown in the North. As the fruit of the home orchard is for home use and local market, consideration is given only to varieties of high quality rather than to those for shipping.

“Each of these home orchards is planned to occupy one acre of ground, which is practically 210 feet square. The same collection of fruit can, of course, be arranged in a rectangular lot, and changing the square into an oblong will facilitate cultivation and save a good deal of turning. The plans may be increased by the addition of extra varieties desired, or used as minimum units to be doubled or trebled on larger pieces of land. In all the fruit lists, the varieties are given in order of ripening.

HOME ORCHARD FOR THE PIEDMONT SECTION

"The plan for an orchard in the Piedmont section (Fig. 23) calls for the following:

APPLES (30 Trees 35 by 35 feet)
 1- 2 Yellow 13-15 Bonum
 Transparent 16-17 Grimes
 3- 4 Early Harvest 18-20 Delicious
 5- 6 Red Astrachan 21-23 Stayman
 7- 8 Red June 24-25 Paragon
 9-10 Williams 26-27 York
 11-12 Buckingham Imperial
 28-30 Winesap

PLUMS (8 Trees, 20 by 20 feet)
 1-2 Red June 5-6 Climax
 3-4 Abundance 7 Wild Goose
 8 Damson

PEARS (8 Trees 20 by 20 feet)
 1-2 Seckel 3-4 Kieffer

CURRENTS (15 Bushes 5 by 5 feet)
 1-3 Cherry 8-10 White Grape
 4-7 Fay 11-15 Pomona

BLACKBERRIES (15 Bushes 5 by 5 feet)
 1-15 Early Harvest

DEWBERRIES (15 Bushes 5 by 5 feet)
 1-15 Lucretia

RASPBERRIES (15 Bushes 5 by 5 feet)
 1-15 Cuthbert

PEACHES (30 Trees, between Apples)
 1- 2 Mayflower 15-16 St. John
 3- 4 Alexander 17-18 Hiley
 5- 6 Greensboro 19-20 Slappy
 7- 8 Arp 21-22 Belle of Ga.
 9-10 Triumph 23-24 ChineseCling
 11-12 Mamie Ross 25-26 Elberta
 13-14 Carman 27-28 Eaton
 29-30 Salwey

CHERRIES (10 Trees 20 by 20 feet)
 1-2 May Duke 5-6 Montmorency
 3-4 Early Richmond 7-8 Napoleon
 9-10 Black Tartarian

BUNCH GRAPES (48 Vines 10 by 10 feet)
 1- 6 Delaware 25-30 Lindley
 7-12 Winchell 31-36 Niagara
 13-18 Lutie 37-42 Concord
 19-24 Brighton 43-48 Catawba

GOOSEBERRIES (15 Bushes 5 by 5 feet)
 1-8 Houghton 9-15 Downing

STRAWBERRIES (2 Rows, 5 feet apart*
 Plants 15 inches apart in Rows)
 Excelsior Klondike
 Missionary Lady Thompson

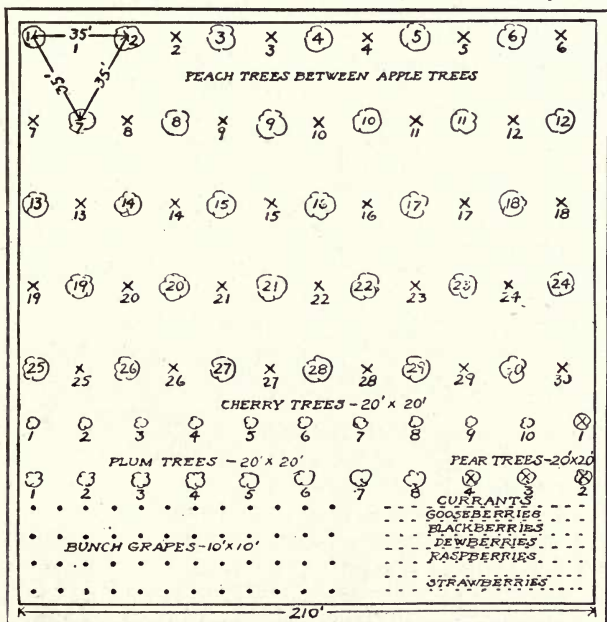


Fig. 23.—Plan of home orchard for the Piedmont section of the South

"APPLES. For the Coastal section the kinds and varieties of fruit have been selected with regard to their fitness for a sandy soil and a long, hot, growing season. There are twenty-four Apples set forty by forty feet, largely Summer and Fall sorts, with a few Winter varieties that have shown themselves resistant to a cotton climate.

"PEACHES. Fifty-three Peach trees are set as fillers between the Apple trees. The varieties are selected to give a continuous succession from the last of May to about the middle of August. It has been found by experience to be difficult and expensive to maintain a spraying schedule that will keep late Peaches from rotting in the hot, moist climate of the Coastal section.

"PEARS. Only a few Pears of the blight-resistant sorts are recommended for the Coastal section. These must be watched for blight just after the blooming season, and all wilted portions cut out. If this is not done the blight will be found very destructive to the fruiting twigs of the Apple trees. On account of their susceptibility to blight it is practically impossible to raise any of the high-quality European varieties of Pears in the South, and even the resistant Chinese sorts must be kept growing slowly and the hold-over infection cut out or the trees will soon die.

"PLUMS. The plums found best for the South are those of Japanese origin. These have a higher resistance to brown rot than the European sorts have. They are exceedingly productive, and in favorable years generally require thinning. Besides greatly increasing the size of the fruit, thinning separates the fruits from one another and thereby retards the spread of brown rot. Though of European origin, the Damson variety produces in the South a vigorous long-lived tree and small, firm fruits. Though much subject to curculio the Damson is quite resistant to rot. It is the standard home variety for jam-making.

"CHERRIES. Cherries, except the most resistant of the sour sorts, are not recommended for planting in the Coastal region. They require little or no pruning and are quite productive when kept well sprayed.

"GRAPES. Grapes, both the bunch and the Muscadine types, can be grown in the Coastal region, but the former only by the most thorough spraying to protect the fruit from black rot. The Muscadines are native to the South and have developed a high degree of immunity to insects and fungous diseases. They are immensely productive and give unfailing crops of fruit, even when neglected. However, they respond to good care in increased quality and quantity of fruit. All the common varieties of Muscadines, like many varieties of Strawberries, have been found to be self-sterile. To insure thorough fertilization

it is well to plant male vines for pollinators rather than to depend upon fertilization from wild vines.

"Muscadines are commonly grown throughout the South on arbors. This necessitates the extending of the arbor as the vine grows in length or becomes choked with dead wood. Experiments with this class of vines have shown that more and finer fruit can be obtained by training on upright trellises like bunch Grapes. As they are rampant, vigorous growers, they need more room than bunch Grapes and are best trained by the six-arm Kniffin system. One whole arm is cut out each season and a new shoot allowed to take its place. This gives a complete renewal of the vine every six years, and insures a constant supply and vigorous shoots. Vines handled in this way are a marvel of fruitfulness, the canes at fruiting time looking solid ropes of fruit.

"PERSIMMONS. Japanese Persimmons grow to perfection in the Coastal section. The trees are dwarf growers and may be set twenty feet apart. Tane-Nashi, a seedless sort, is the best of all yellow-fleshed varieties. The fruit ripens long before frost, thus refuting the old idea that Persimmons must be frozen to get the pucker out of them. Tane-Nashi is one of the few varieties that will carry its fruit to maturity without pollination. The dark-fleshed varieties, Zengi and Hyakume, are not astringent and may be eaten while still hard. When pollinated the fruits will carry to maturity and not drop off as so many Persimmons do when partially grown.

"FIGS. Figs do not do well in the orchard, where their tender, surface-feeding roots are injured by cultivation. They give their best results in sheltered corners about buildings, where their roots are undisturbed and can obtain a constant supply of moisture. The Fig is a very productive fruit if it is assured of a continuous supply of moisture. For this reason the bushes do best if heavily mulched. In long droughts they should be watered with a hose. In the far South the Fig can be grown as a tree, but toward its Northern range, in the Carolinas and in Virginia, where it is sometimes subjected to heavy freezing, it is safest grown in bush form.

"PECANS. It would be hard to find a more satisfactory tree for the Coastal South than the Pecan. Those who were far-sighted enough to plant suitable varieties of Pecans a decade or so ago are reaping a rich harvest today. As the Pecan is long-lived and of stalwart growth, it needs too much land to grow in the acre home orchard. However, these very characteristics make it an ideal tree for lawn and dooryard planting. It makes a tall, beautiful, symmetrical growth that is equaled by few shade trees, and in nut production it has no competitor.

"Pecans, like other nut trees, will not come true from seed, and seedling trees have, as a rule, been found very disappointing. The only way to be sure of productive, thin-shelled, full-meated varieties is to plant grafted or budded trees of the right sorts. Stuart and Schley are two varieties that have been found to give good results throughout the Coastal region. The Pecan will grow on a variety of soils and can be counted on to give good results where corn and cotton can be grown. Contrary to general opinion the Pecan tree cannot be successfully grown on sour or swampy land, though it is not injured by overflow, provided the soil has good natural drainage during the growing season. Pecans if given good care will come into bearing in about the same time as Apple trees.

"As the Piedmont region is characterized by rolling, hilly land, the orchard for that section is planned on the hexagonal system for Apples and Peaches. This allows for better fitting in of the trees in terrace rows."



Chaining or wiring the broken arms of a tree is one of the wrong ways to mend Y crotches.

Buying the Plants

Nurserymen's Reliability—What and Where to Buy—Spring vs. Fall
Planting—Time to Order

LONG experience and wide observation prompt me to say that the nurseryman is the backbone of the stock he sells; and that the number of upright nurserymen is legion. I have a considerable acquaintance among nurserymen, but I don't know one whose reputation for square dealing I can call in question. In all my dealing with nurseries I have invariably been well treated.

This statement I make in simple justice to a maligned body of men the nature of whose business I know from personal contact to be peculiarly exacting, liable to carping criticism and to whose splendid work the whole continent owes a debt of gratitude which can never be repaid, for the introduction and dissemination of new and superior as well as staple fruits and ornamental plants.

I therefore say to any reader hesitating to plant certain varieties of fruits: Consult several nurserymen, more particularly those whose plantations are comparatively near-by. If there are none within easy reach go farther, to the large ones. These men will always gladly give advice as to the kind of stock to purchase, when to buy, etc. In general, however, on points such as these it is well to know the underlying principles, for nurserymen like the rest of us are pretty much "sot in their ways" and may therefore unduly emphasize some pet theory and disagree with one another.

The question of the locality—North or South—from which to buy stock may be dismissed by saying that while in theory a tree grown in the North should do best in the North and *vice versa*, experience shows that well-grown, well-ripened stock from the South, properly handled, does fully as well as Northern grown, and stock from the North equally well in the South. Such a statement, however, must not be allowed to dispel the other advantages of buying near home; namely, smaller freight bills, less drying of stock in transit, interest of the local nurseryman, etc.

The youth of the stock is highly important. Blackberry and Red Raspberry plants should be one-season "suckers" or "root cuttings," Black Raspberry and Dewberry one-season "tips" or in any of these cases older "transplants," the latter preferred because sturdier and likely to bear sooner. Strawberries may be pot-grown for sale during



Fig. 24.—Old-fashioned garden of fruits, flowers and vegetables. Isn't it "homey" looking?

Midsummer and early Fall, or freshly dug one-season "runner" plants for Spring setting. Currants and Gooseberries are usually sold as two-year plants grown from cuttings, though sometimes one-year and three-year plants are called for. The last, unless root pruned or transplanted, are less desirable than younger plants.

In the South "June-budded" tree fruits are popular. The buds of desired varieties set in June grow the same season and the trees may be planted that Autumn—five months after the operation—or the following Spring. In the North such trees are imported from Southern



Fig. 25.—Short trunks and wide spreading branches favor strength and admission of light, hence finer and better colored fruit

nurseries for Spring but not for Fall planting. In the North, however, Northern grown trees are more in demand. The buds set in late Summer do not start to grow until the following Spring and they do not make salable trees until about fourteen months after the budding has been done. If fully mature they may be set in the Fall, otherwise not until the Spring—eighteen or nineteen months after being budded. In all cases, even though there may be an actual difference of twelve months, the trees are called "one-year" or "two-year," etc.

There is no difference of opinion as to the age at which Peach trees

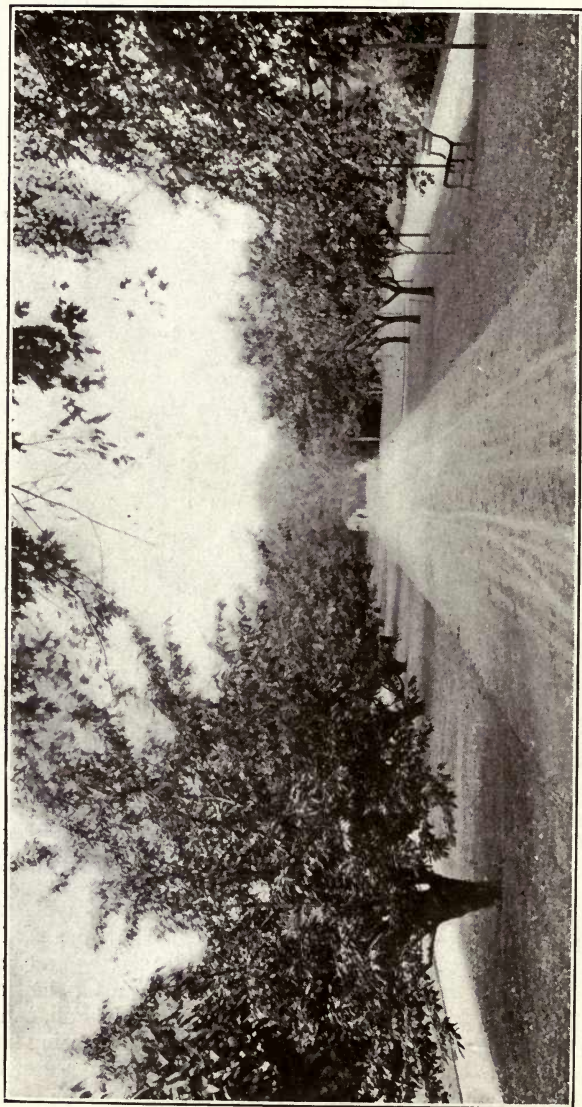


Fig. 26.—Cherry and other fruit trees are excellent for planting beside the road approaching the house

do best when set. They should never be older than "one year." With Apples, Pears, Plums, Cherries, Oranges, Lemons, Nuts, and other trees, practically all fruit growers prefer two-year trees to older ones and a steadily increasing number favor one-year trees. Such trees cost less to buy and to ship. None but thrifty ones are salable at that age—a very important point. They may be headed just where desired (Fig. 14), whereas older ones cannot, having already formed their heads—a specially important point where low heads are desired, as they should be. Also young trees transplant far easier and better than do older trees.

Except as specified below, the argument of some nursery agents that trees older than two years will bear sooner than young ones is

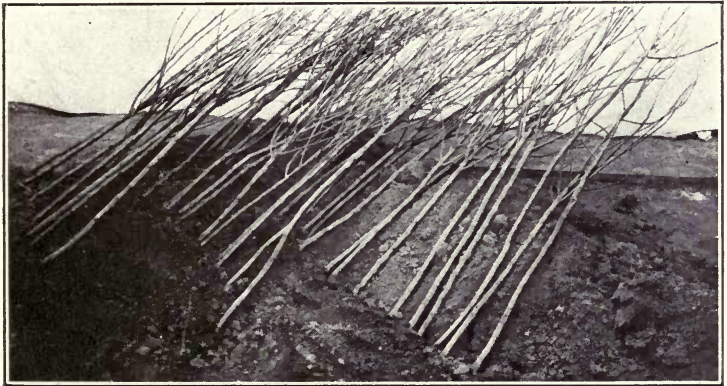


Fig. 27.—Heeling-in trees either for holding over Winter or until planting time is easily done by burying the roots and part or even all of the trunks

not sufficiently supported by the experience of practical fruit growers to be accepted. The exception is in the case of trees which are systematically root pruned while still standing in the nursery row. But such trees necessarily cost much more than does ordinary nursery stock, so they are in a class by themselves.

Spring *vs.* Fall planting is a moot point. The three main advantages of Fall planting are: 1, Probability of getting the desired varieties; 2, the trees being planted in the Autumn, growth may begin as soon as Spring opens; 3, the work being done in the Fall does not interfere with the Spring rush. On the other hand nursery-men may be tempted to dig before the trees are "ripe"; that is, before the leaves fall naturally. This is always a mistake which often proves



Fig. 27a

1. Digging the trench
2. Putting shrubs in trench
3. Putting soil on roots of shrubs in trench
4. Tramping soil over roots in trench
5. Heeled-in shrubs in trench
6. Digging up for planting the heeled-in shrubs

fatal. Leaves must not be clipped or pulled, but allowed to fall naturally before the trees are dug. Another objection to Fall planting is that the roots may not get a good hold on the soil before Winter sets in. But where at least three weeks open weather can be counted upon before Winter this objection has little weight. Trees received in Fall but too late for planting may be heeled in as shown in Figure 27.

As to advantages in favor of Spring planting, the trees if freshly dug should be in prime condition. They certainly will not be as subject to Winter injury as Fall set trees the first Winter after setting. Against this advantage are the disadvantages noted above and the probability that planting will be delayed until too late to secure favorable conditions of growth.

I have always had excellent success in Fall planting fully matured fruit-trees, Currants and Gooseberries. Raspberries and their kin I have never planted in the Fall because a neighbor's experience with that practice taught me the lesson not to do it. He lost from 15 to 100 per cent. of the various varieties Fall planted. I know some growers favor planting Blackberries and Red Raspberries in the Fall, but not Dewberries or Black Raspberries. It is safer, in my opinion, to wait until Spring for all of them.

The best size and grade of trees to buy is always the medium one, four feet for a one-year, and five to six feet for two-year trees. It is as important to avoid the burly, overgrown ones as the runts. Both are likely to make inferior trees after transplanting.

The price to pay should always be a liberal one—the one a first-class nurseryman should get for first-class stock. Nothing is to be gained and much may be lost by hunting up cheap stock. It is usually better to deal direct with a first-class nursery or with its duly certified, preferably resident agent than with the itinerant tree pedlar. While the former often ask high prices their reputation for square dealing is at stake, whereas the latter has nothing to lose. It is well to have several catalogs to choose among because certain nurseries offer better stock or better prices on certain specialties.

Order early—the earlier the better. One of the surest ways to court disappointment is to make delays, for thereby the desired varieties may have been “sold out,” none but older trees, larger or smaller sizes may be left, the nurseryman will probably be so swamped with orders that late ones cannot be reached while planting conditions are favorable, there may also be delays in transportation, etc. Therefore, be warned! Order early! Were it not for the fact that nurseries are swamped with orders at the last minute, this suggestion would seem superfluous. The nursery will hold your shipment till the proper time to ship.

CHAPTER VI

Soil, Fertilizers, Situations, Cover Crops

Manures and Fertilizers—Situation for Fruit Plantations—
Averting Danger of Frost Damage—Green Manures

FOR the home fruit plantation perhaps the great majority of people have only Hobson's choice as to soil—they must be content with what they have. There's no use wishing for the ideal—well-drained, mellow, deep, fertile loam—because even where there is a chance to choose, such a combination of conditions is about as common as hen's teeth. What can and should be done is to work towards the ideal by rational management of the soil, beginning with what good conditions are already present and making improvements from year to year.

In many cases the planter will be forced to start with a true soil strewn with builders' rubbish—mortar, concrete, bricks, stone, shavings, pieces of wood and other junk—buried under several inches of "subsoil" from the cellar excavation. This is about as discouraging a combination of untoward conditions as could be planned. Several years may be necessary to make such "dirt" acceptable to Strawberries. For bush and tree fruits about the quickest thing to do in such cases where the whole area cannot be worked over, is to dig holes deep enough to reach below any "hard pan" or impervious layer as suggested below.

Where such unfavorable conditions do not exist soils may generally be greatly improved by deep stirring, not by bringing the subsoil to the surface but by using a subsoiler (sometimes called a subsoil plow) which merely breaks the hard ground below the lowest point which can be reached by the true plow. When neither plow nor subsoiler can be used the spade is the next best tool. To get best results with this the area should be trenched as follows:

Dig a strip, say a foot wide across one end of the area to be planted, and wheel this earth to the farther end. Next spread old manure, bone meal or other general fertilizer in the bottom of the trench, dig this earth, break it up and mix the manure with it to the full depth of the spade blade, thus making the bottom of the dug layer two "spits" or spade blades deep. Now start on the second strip across the area, throwing the earth upon the top of the loosened and enriched subsoil. Next add manure and dig the lower stratum just laid bare. And so on till the whole area is dug and trenched. Finally fill in the last trench with the soil wheeled from the first one.

As this method means a lot of work it may not appeal to the planter, even though it is recognized as one of the best of garden practices. Most of the good effect of it may be secured as follows: Dig out and throw in a pile the surface soil in a circle around the place where a bush or a plant is to be set—say five feet diameter for a tree, two

feet for Currant and Gooseberry bushes and a trench, say fifteen to eighteen inches wide, for Raspberries and Blackberries. Next dig out and throw in a different pile the subsoil to the depth of six to twelve inches. Now throw in a liberal shovelful of well-decayed manure and any available old bones. Next shovel in the surface soil, adding ground bone, etc. In this soil set the tree or shrub and use other surface soil to fill the hole. Finally scatter the pile of subsoil thinly upon the surface, or place on top of the filled-in surface soil around the trees. Some of the most satisfactory results I have ever had in planting have been secured in this way



Fig. 28.—How easy to prune and gather fruit from low-headed trees

FERTILIZERS

Under ordinary garden conditions where vegetables and small fruits are grown among the trees it is not likely that the trees will suffer seriously from over-feeding, so even fresh manure may be applied rather freely in the Spring or late in the Fall. This is not advisable, especially with the Peach and the Grape, where no other crop is grown to take care of any excess plant food that may be present. The "richness" of manure depends mainly upon the nitrogenous materials present. The most conspicuous functions of this material are to make sturdy growth of twigs, large dark-green leaves and when in excess to delay, reduce or prevent fruitfulness. Moreover, the long sappy growths often induced by excess of nitrogen are almost sure to suffer from frost during Winter. Care must therefore be exercised to avoid giving too much manure to bush and tree fruits. Should the growth of the twigs be decidedly inferior and the leaves small and their color a sickly yellowish instead of a healthy green, manure should be added. The best time to apply it is in early Spring.

No fear need be entertained as to the application of wood ashes, ground bone and other general fertilizers at any time. Dried blood, tankage and fish scrap are also good but should be applied in Spring, because the nitrogen they contain will thus have the best chance to perform its function with the least possible loss. Nitrate of soda is seldom needed for tree or bush fruits. When it is used it should be applied only after growth starts in Spring, never later than mid-Spring, because it is the most stimulating of all fertilizers and its effects should all be confined to the early part of the season.



Fig. 29.—Keep the ground bare around young trees, though cover crops are growing thickly just beyond the circle

As far as possible every particle of material that will decay—leaves, stems, garbage, etc.—should be saved to make “plant food” and if not fed to poultry or other animals, made into compost with sods, manure and any slowly soluble commercial fertilizer, such as ground bone, wood ashes and tankage. Bones, whether ground or not, are very valuable for burying beneath grape vines, trees and bushes. Surplus mice, rats, cats, dogs, horses, elephants and mastodons may thus similarly be made to give better accounts of themselves than by polluting food, making night hideous or jostling us humans too much. One of my neighbors paid \$1.50 for a seven-foot shark, which he cut up and buried in his small fruit plantation. This is the only useful shark I have heard of.

SITUATION FOR FRUIT PLANTATIONS

Where only one piece of land is available for a fruit plantation, the trees susceptible to frost injury, especially as to buds—Peach, Japanese Plum, Almond, Apricot—should be placed where they will be retarded as much as possible in Spring. The best position for them is the north side of a building, a wall or a northern slope; the worst, an eastern, south-eastern, a southern slope or near a wall facing in these directions. The reason is that the northerly and westerly are the retarding aspects; whereas the southerly and easterly are the accelerating ones. Buds are sure to be injured by frost in the latter situations because they are encouraged to swell prematurely. In a less degree the same remark is true of most other early blooming tree and bush fruits. Currants and Gooseberries are exceptions. For them the steam does not have to be turned on to make the place warm enough to dress in! They are often in leaf when the last snow falls.

Where the land is pockety or low it is often unsafe to set early blooming fruit plants, because such situations are generally frosty from the settling of cold air in them. Conversely, elevated situations are much more safe as a rule, because the cold air drains away just as water does. In one case I know well there is a fall of five or six feet from the front to the back of a 140-foot lot and a valley about 75 feet deep in the rear and deepening farther away. The air drainage thus provided helped perishable plants such as Lima Beans, Dahlias and Cannas to live until late October, whereas only a few hundred yards away they were killed a month earlier. Where an elevation such as this can be secured it is therefore an asset. What is true of Autumn is also true of Spring in this respect.

Nearness to a large body of water also has its influence upon fruit growing. The lot mentioned above is about half a mile from a bay on Long Island Sound. The cold breezes in Spring help to retard bud swelling and the warm ones in Fall help to extend the season. Only a couple of miles away the influence of the water is nil. There the



Fig. 30.—A stub is a menace to the life of the tree

season opens a week or more earlier and killing frosts occur four or five weeks earlier in Autumn.

COVER CROPS

In home fruit growing as in commercial practice many advantages may be gained by sowing certain kinds of crops not to be harvested, gathered for family use or for live stock, but solely to benefit the trees. Cover crops, as these are called, since they are sown between Midsummer and early Fall to cover the soil from then until Spring, perform various functions. They protect the soil on slopes from being washed by rains. Because of the time they are sown they seize upon already soluble plant food that might otherwise be lost during Autumn or Winter in the drainage, or be washed over the land by rains and melting snow. They return this food, together with their own tops and roots, when they decay, after being plowed under in the Spring. When they decay they also increase the water holding capacity of the soil.

When Crimson Clover, Hairy Vetch and other legumes are grown much nitrogenous material is added to the soil, because through the aid of certain bacteria these plants have the ability to utilize nitrogen contained in the air.

Land protected by cover crops is slower to freeze in the Fall, the freezing is shallower than on uncovered land and the thawing in Spring is quicker in consequence. Hence also roots of tree and bush fruits are less injured by the effects of Winter-heaving and settling.

By adding vegetable matter through the decay of cover crops, clayey soils become easier to work and may be worked earlier in the Spring, sooner after rains and during a longer period; moreover their tendency to dry and bake is lessened and their water-holding capacity increased. In all cases where the physical condition of the soil is improved the tree roots can penetrate farther in search of food and water and thus insure better growth, health and productivity of the fruit plants.

About the only disadvantage in using cover crops, more especially the legumes, to excess is that the soil may become so filled with moisture-holding



Fig. 31.—Well made cuts. No stubs left

and nitrogenous material that, especially towards the close of the Summer, tree growth may not be checked early enough in the Fall to favor the highest quality of fruit or the best ripening of the wood. In the latter case more or less injury by frost may occur as a consequence of the sappy growth. Such conditions, however, are comparatively rare. When they seem to be imminent in either case mentioned they may be prevented by sow-



Fig. 32.—Wrong way to cut a branch—leaves a stub which will never heal over

ing crops that will compete with the trees for the food and moisture; for instance, Buckwheat, Rye, Rape, Turnip and Millet.

Whatever cover crop is sown it must be turned under in Spring as soon as the ground can be plowed or dug. If possible it should not be allowed to grow at all in Spring, because by so doing it will rob the soil of moisture and plant-food at a time when no such thing should occur. The longer it is allowed to grow at that time the more slowly will the stems decay, because they form a rather impervious layer of dryish material through which moisture can with difficulty ascend to the upper soil. For the same reason the later the plowing is done the more damage will occur to the trees through the unnecessarily late loss of feeding roots. Such a loss while the trees are perhaps in full leaf is serious. It may produce a pronounced check in growth at the wrong time of year and by a wrong method. Any loss that may occur when early plowing is done is of little or no consequence, because it comes at a time when the trees have scarcely begun active growth and when such losses are most easily made good by the easy development of new-feeding rootlets.

To be ideal a cover crop should be capable of starting well from seed sown when the soil is dry, as in July or August. It should grow quickly and abundantly so as to check tree growth in late Summer or early Fall and form a heavy mat of herbage before Winter sets in. Whether or not it should live over Winter is a disputed point; some men want it to live; others to die. When it dies there is no danger of its doing any damage to the trees, as might

be the case if it lived and was allowed to grow too late in the Spring.

Obviously, all the advantages just mentioned cannot be found in one crop. So it is advisable to make combinations. Buckwheat (Fig. 98) starts quickly, makes rapid growth, but kills with early Fall frosts. Rye is slower to start but it is hardy. The two are therefore sown together. However, they add no nitrogen to the soil, merely seize upon what soluble plant food happens to be available. Hairy or Winter Vetch, a hardy legume, is often sown with Rye or the Rye-Buckwheat combination. Canada Field Peas are often substituted for the Vetch, but are less hardy. Crimson Clover sown in Midsummer usually makes



Fig. 33.—Well healed pruning wound. Water sprouts

an excellent crop on good land before Winter. In cold localities it may Winter-kill but it will leave its dead tops and roots to benefit the soil. Common and cowhorn Turnips and Dwarf Essex Rape are useful for their influence in making soluble phosphoric acid from insoluble combinations, in seizing upon already soluble plant food in the soil and holding these materials over Winter. For the home orchard therefore a combination of some or all of these crops may be used. In the South Cow Pea, Soy Bean, Velvet Bean and Crimson Clover are more generally used than in the North.

In the home garden it may be argued that the land is occupied by garden or other crops as well as the trees and that, therefore, a cover crop cannot be sown until too late. It is then a question of making a rearrangement of crops so that the area may be sown with a Winter cover. For instance, Crimson Clover, Rye and Buckwheat may be sown at the usual time or perhaps even later among Tomatoes, Sweet Corn, Melons, Cucumbers and other crops killed by early frosts. It will do little if any damage to these crops and will more than offset this by its humus and nitrogenous-forming material. Rye and Buckwheat may be similarly sown. Since the cost of seed is usually small the idea should be to accept the risk for the probable gain. The importance of such sowing is far too little understood. Anything that will grow during the cool, or even cold, Autumn weather should be sown. For every leaf and stem produced and buried means a gain to the water-holding power of the soil.

Summer Care of Plantation

Advantages of Clean Cultivation—Pruning—Rejuvenating Neglected Trees—Grafting and Budding—Thinning the Fruit

CLEAN cultivation, starting as soon as the ground can be worked in Spring and continuing until Midsummer and then followed by a cover crop, is the almost universal practice of successful fruit growers. Cultivation has the advantages that it conserves moisture, makes plant food available, helps to control certain insects, prevents damage to tree trunks by mice, enhances the quality and increases the quantity of fruit, controls weeds and permits the use of a leguminous cover crop from which all the nitrogen that fruit plants will need can be secured.

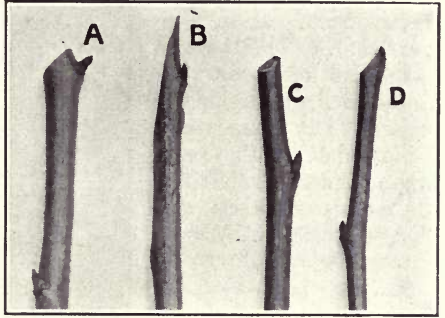


Fig. 34.—Right and wrong ways to cut twigs. A, right; B, too long a slant; C, too long a stub; D, too close to bud



Fig. 35.—Right place to cut limb

All the cultivation that a young fruit plantation needs may be given to vegetable crops planted between the tree rows. When crops such as Melons and Tomatoes, that either mature by late Summer or are killed by early frosts, are used the cover crop may be sown among them at the usual time without in the least jeopardizing the vegetable yields. It is imperative, however that the cover crop be plowed or dug at the earliest possible moment in Spring, preferably before it starts to grow. When the fruit plants begin to bear the area devoted to vegetables must be reduced, both because the vegetable yields will be smaller and because the fruit plants need the food and water. When the trees and bushes are in full bearing the growing of vegetables may be reduced to

nothing. Everything, however, depends on the way the grower manages

PRUNING

If people who plant fruit knew and applied a few general principles their trees would probably begin to bear younger, continue longer and produce better fruit year in and year out. The bushes take care of themselves fairly well, even under neglect, but the trees! Unfortunately, they are either allowed to shift for themselves or they are "pruned to death." Which extreme is the worse would be hard to say. And yet good management is not difficult when the

fundamental principles are understood. But be-

fore any of the principles are applied let this axiom become part of your being: Better the watchful eye than the active saw! It will see prospective undesirable developments and prevent the necessity of using the saw in later years.

While standard trees are young—up to the fourth or fifth year—about the only pruning necessary after the orchard has started should be the removal of branches that will sooner or later interfere with the ones desired, and the more or less shortening of rampant branches that threaten to rob the others of food, light and air. The less pruning done during this time the better, because the removal of



Fig. 36.—When a stub is left where a large branch is cut off decay enters and the tree is doomed. This tree is still living but may break any day. Notice the Raspberry plant growing in the cavity



Fig. 37.—Pear fruit spurs



Fig. 38.—Sweet Cherry blossoms near the base of last season's growth

the little twigs that form on the young trees. These show that the trees are getting ready to bear fruit, for they will become fruit spurs.

Summer pruning tends to favor bud formation for the following season's fruit (see page 78).

When pruning or shortening twigs use a sharp knife (Fig. 34A), placing the blade on the opposite side and just even with the base of the uppermost bud to remain. Then make an oblique cut so the upper edge will be about a quarter of an inch above this bud. Thus healing will be favored. If the cut is made too long or too slanting the bud will suffer or die, and if a stub is left above the bud it will die back to the bud and proper healing will be actually prevented. (See Fig. 34C.)

wood during the dormant season tends to the production of still more wood. Thus, severe pruning during Winter may postpone fruit bearing—perhaps indefinitely, if annually persisted in.

Whenever a branch must be cut off make the wound as close to the part that is to remain as possible (Fig. 31) so there will be neither a stub (Fig. 30) nor even a shoulder (Fig. 32). This favors healing (Fig. 33). When a stub is left (Figs. 30, 32) decay is sure to follow sooner or later as shown in Fig. 36.

On Apples, Pears, Cherries and Plums be sure to save and encourage



Fig. 39.—Cluster buds of Apple

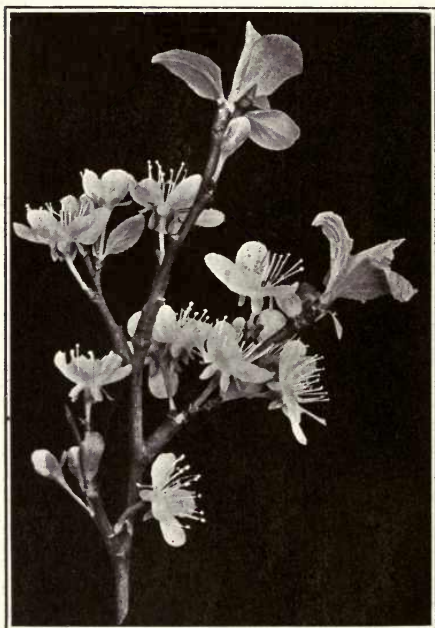


Fig. 40.—Plums bear their blossoms partly on spurs

cause maturing a fruit is an exhaustive process the direction of growth changes each year and fruit is borne on each spur usually only each alternate year. With age the spurs (Fig. 37) often become very gnarled and crooked. If healthy and sturdy, however, they may be as productive as young spurs.

Cherries bear much of their fruit on spurs (Figs. 38, 41), but because the terminal bud generally extends the twig the spurs are more or less straight. Most of the other buds on the spurs produce blossoms, though one now and then may develop a branch spur. Blossom buds are also borne near the base of the annual growths of the previous year.

Intelligent pruning of trees in bearing depends on the method of bud-bearing peculiar to each species. Blossom buds are rounder and plumper than branch or wood buds. Apples and Pears bear most of their blossoms at the tips of "spurs," in clusters surrounded by leaves (Fig. 39). Some may come on the sides of twigs produced the year before. Because of this terminal feature and be-

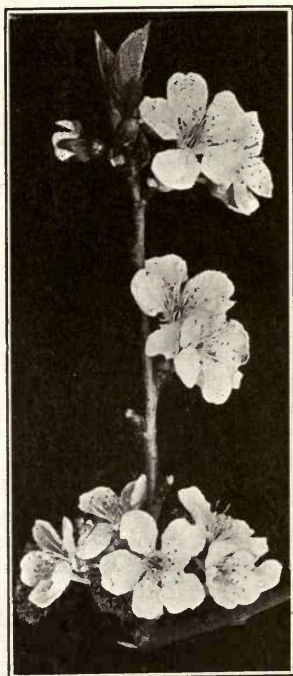


Fig. 41.—Sour Cherry bloom

The Plum (Fig. 40) and the Apricot bear their blossom buds partly on spurs and partly on young growths, but in more varying proportions than with the Cherry.

The Peach is different. It produces some blossoms on wiry growths in the interior and on the lower parts of branches, but these growths live only a few years. By far the largest part of the blossoms are borne beside branch buds on growths of the previous season (Fig. 42). They can be easily recognized, first because of their position and second because of their roundness. Normally a blossom bud is on each side of a wood bud.

Never prune or break off spurs unless there are too many or they are failing, because a spur removed is gone forever. On the other hand, always cut back Peach twigs severely—often 50 to 75 per cent. Unless you do the tree will extend farther and farther out and become more and more likely to breakage each year because of the increased leverage. Again, such cutting will also concentrate the fruit-bearing area in the reduced

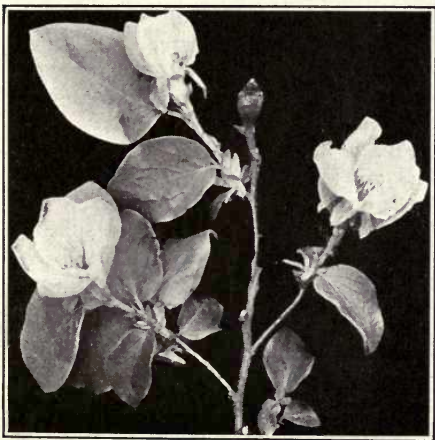


Fig. 43.—Quince flowers are always terminal on twigs of this year's growth. Notice mummy of last year's fruit



Fig. 42.—Peach blossoms as normally borne

space and thus also reduce the amount of thinning of the fruit that must be done in Midsummer.

The Quince is different again. It bears its blossoms at the ends of new growths that spring from buds that have wintered over (Fig. 43).

Pruning for fruit, therefore, consists in keeping the tops fairly open and reducing both the number of annual growths and shortening the remaining ones a third to a half.

REJUVENATING NEGLECTED TREES

Often neglected trees may be made fruitful in a shorter time than newly set ones could be. Naturally the younger the trees to be worked over the better, but vigor is of more importance than age. Apple trees 50 to 100 years old are often well worth the work put upon them. Never mind how much dead wood there may be.



Fig. 44.—Water sprouts and suckers in abundance indicate vigorous roots

It may have died merely for lack of light and air or because of insects and disease. Notice the young growths, particularly of the suckers at the base of the trunk and the water sprouts higher up (Fig. 44). If abundant and sturdy they show that the roots are all right. Such trees are generally easiest to renovate.

In all work whenever a large branch must be cut off always make a cut from below upward a foot or more away from its attachment to the main limb or trunk. When the saw sticks pull it out and make a second cut from above at the same point. Soon the branch will drop off. Now cut off the stub close to the main trunk or limb that is to remain. This method will prevent splitting or tearing of the trunk due to leverage as the branch breaks.

Renovation should start with the removal of the dead wood; next the diseased and dying. Often this is all that dare be taken out the first season, because so much light may enter that damage may occur to the branches hitherto kept in dense shade. Always delay cutting off the water sprouts until the last. Indeed, it may often be postponed until the following season, when the decidedly inferior may be removed, leaving the better placed ones to form new branches where old ones must be replaced.

Often the tops are too high. They may be lowered, but be care-



Fig. 45.—A neglected tree before pruning. It has much dead and dying wood due to dense shade, caused by very leafy small branches in the top. This leafiness has also encouraged excessive elongation of the branches in the upper part of the tree. As a result the top is too hard to reach in spraying, thinning, harvesting and pruning. The general form of the tree is good

Fig. 46.—After pruning the tree shown in Fig. 45. Notice how open it looks after the removal of the dead and diseased wood; also how much lower it is now that the top has been cut back



Fig. 47.—The same specimen as in Fig. 45 the Summer following. If you did not know of the pruning as shown in Fig. 46, would you think this tree other than "natural"? In a couple of years the little irregularity at the right will disappear and the tree be very symmetrical as well as low headed

ful! Do it intelligently. When few or no water sprouts are available fairly low down cut the upper parts back severely so as to force new growths of water sprouts. But avoid making one big cut to accomplish this result. Remove many small branches instead.

When the top is high and thin, but when there are good well-placed water sprouts, low down, a much

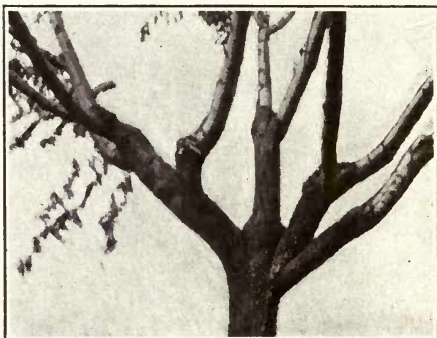


Fig. 48.—New branches developed by “dehorned” Peach tree

larger amount of wood—perhaps even large branches—may be cut out.

Trees with fairly good but too high tops should be lowered gradually—during three to five years—so as not to upset the bearing habit but at the same time to develop lower heads. (Fig. 45.)

Often Winter injured Peach trees may be saved by severely cutting back the tops and thus concentrating the available food. Also old, tall and widely spreading ones may be rejuvenated by dehorning (Fig. 48).

Except where cuts are more than two inches in diameter, painting the wounds will be unnecessary as healing will be quick. For large wounds pure white lead in pure linseed oil is generally recommended, but creosote *properly applied* is probably better, since it is antiseptic and more lasting in its effects. *It positively must not be allowed to touch the young wood or the young bark.* The only safe part to touch is the heart wood, but even this must not be too liberally creosoted. The brush must be “wrung out” so there will be no drop to ooze down upon the growing parts—just a thin, thin covering over the heart wood. It will soak in and

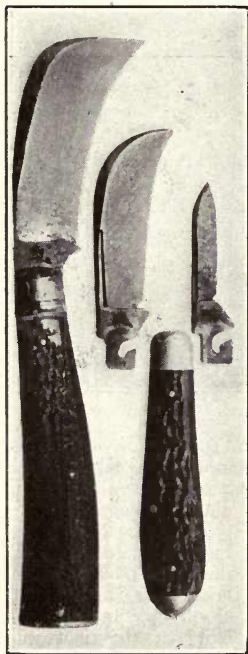


Fig. 49.—Ordinary heavy pruning knife and one with removable blades

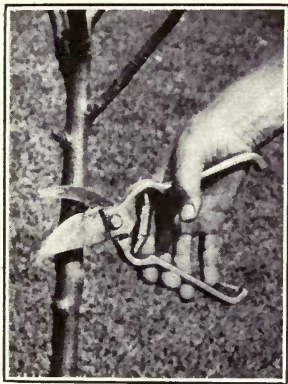


Fig. 50.—Wrong way to hold shears

trees the knife (Fig. 49), if used only when sharp, will make a better job.

When necessary to remove limbs too large for either style of shears the saw is needed. The best style (Fig. 53-1, 2) resembles a meat saw but has a swivel at each end so the blade may be turned at any angle—a very great convenience in sawing where other branches would interfere with ordinary saws. This swivel saw does excellent work where the branches are not more than two or three inches in diameter. For larger ones a rather

prevent the entrance of decay. Very large wounds—four or more inches in diameter—should be re-creosoted each year until healed over.

The kinds of tools needed will depend upon the character of pruning to be done. For pruning berry bushes the stout, single hand shears (Fig. 51) is the best tool. Sometimes the double handed shears (Fig. 52) is of service in cutting thick and dense canes. These two tools are also useful in pruning fruit trees, though for use upon dwarf



Fig. 51.—Right way to hold shears blade toward part to be left



Fig. 52.—Neglected Currant bush after pruning

heavy, long but narrow-bladed saw is best (Fig. 53-6). Positively the worst saw is the double-edged horror which until recently has had perhaps the greatest sale. Not content with making poor cuts, it is prone to gash parts of the tree that should not be wounded and, viper-like, lacerate the

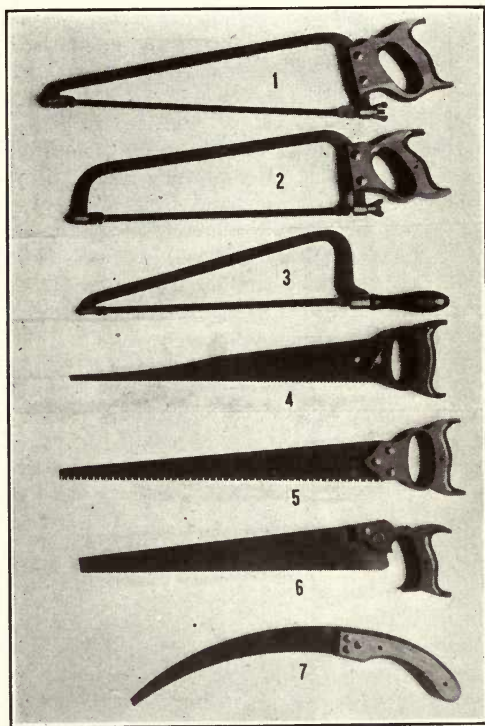


Fig. 53.—Various styles of pruning saws. 1 and 2, Good swivel blade types. 3, Poor hand grip, otherwise a good saw. 4, Common, fine-toothed saw, good for narrow quarters. 5, Double blade with upper teeth filed off to avoid damage. 6, Weak handled, but otherwise good saw. 7, Cuts only when pulled, often tears the branch instead of finishing the cut properly

hand that guides it! Shun it.

The pole pruner has very limited use—the shortening of branches that cannot be reached by better tools. It cannot be made to do good work, so the less it is used the better.

GRAFTING AND BUDDING

For curiosity's sake and for convenience it is a good thing to know how to graft and bud, for thus seedling or worthless trees may be made useful and single trees made to produce several varieties. The term "stock" is applied to the part of the tree in or upon which the "scion" or "bud" from the desired variety is placed. The most popular methods are so simple that anyone may be

successful, provided the conditions are fulfilled. These are:

1. Select trees of the same species. Any Apple will grow on any other Apple; Pear on Pear and so on. In a few cases different species may be made to succeed on each other; as Pear on Quince, Plum on Peach, but not Quince on Pear nor Apple on Plum.

2. Do the work at the proper time—when the bark will separate easily from the wood. For the grafting method described on page 71, this is shortly after growth starts in Spring; for the budding method, usually during late May or early June in the South and from

Mid-July to early September in the North.

3. Be sure to bring the cambium layer of the scion in intimate contact with that of the stock; otherwise the two probably will not unite. This layer is the thin film of tissue between the bark and the wood. It is as thin as the finest tissue paper.

4. Protect the parts either with grafting wax or twine or both until union is assured. When wax is used alone no damage will result, but when tying is done the strings must be cut before the bud becomes "strangled" by the tightening of the strings due to growth.

Shield budding, the simplest form of budding, is done as follows: In a young stock, preferably not more than two seasons old, make a cut about two inches long parallel with the direction of growth (up and down). Half or three-quarters of an inch from one end make a cross cut to form a T. Gently and slightly pry up the bark from the wood below. Now choose a well ripened twig of the variety desired. Pick

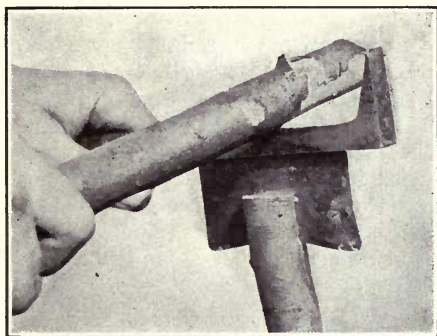


Fig. 54.—Making the cleft for grafting

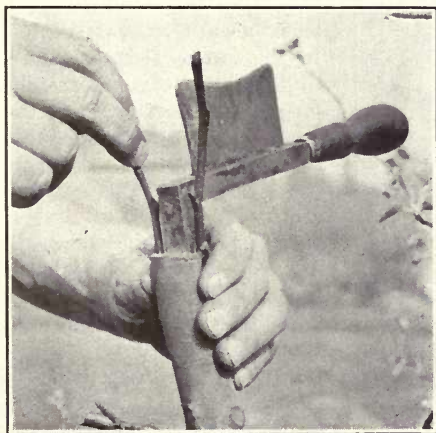


Fig. 55.—Inserting scions in stock

out a thrifty bud with a good leaf stem at its base. Cut off all but about half an inch of this stem, thus leaving a little handle. With a very keen knife cut the bud from the twig so as to leave a shield-shaped piece of bark and wood about one-eighth inch thick with the bud near the center. Gently press this shield into the stock at the T already cut and adjust it so the whole of the cut surface beneath the bud rests against the wood of the

stock. Next wind narrow strips of cotton cloth firmly around the stock so as to close the wound but not cover the bud itself.

In a week to two weeks examine the bud. If it has shrivelled it has failed to "take"; if it is plump it has made a union. In either case the binding must be cut so growth will not strangle either the bud or the branch being operated upon. In the North the bud will remain without perceptible change till Spring. In the South it should begin to develop a shoot before Midsummer. After growth has started the old top of the stock may or may not be cut depending upon whether or not it is wanted to bear fruit.

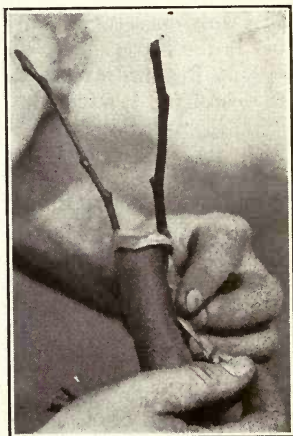


Fig. 56.—Waxing cleft grafts



Fig. 57.—Buds sprouting on graft. The other scion grew but it was accidentally broken off

In cleft grafting a branch, preferably not smaller than half an inch in diameter nor larger than two inches, is squarely sawed off so as to leave a stub six or more inches long (Fig. 54). A grafting chisel or a knife is then used to make a cut across the center. In this cut a wedge is driven to force the edges of the cut far enough apart to insert the scions (Fig. 55). Scions must be of well-ripened, dormant twigs of the previous season's growth and of the desired variety. Several may be made from one switch. The lower end must be cut with a keen knife so as to form a long thin wedge, preferably slightly thicker on one side than the other. One of these scions is placed at each outside end of the cut in the stock at a very

slight angle so the cambium layers of stock and scion shall be in contact and so they will be held snugly in place when the wedge is removed. After removing the wedge cover all wounded surfaces with grafting wax (Fig. 56).

In two to four weeks one or both of these scions should grow (Fig. 57). When both grow cut off the poorer if the stock is under one inch, but let both grow the first season if the stock is larger so as to heal over the stub quickly. In such cases cut the inferior one slightly above its base, preferably just as growth starts the following Spring.

Bridge or repair grafting, done to save injured trees, consists in inserting scions both below and above the wound and long enough to stretch across. The whole is then covered with grafting wax or bandages. In due time growth will be as shown in Figure 58.

Whip or tongue grafting is very convenient for branches about one-quarter inch in diameter. Stock and scion must be of nearly the same size. Each is first cut across with a long slanting cut. Then each is split with the knife for about an inch straight down near the center, thus forming a tongue. Stock and scion are then fitted together so the shorter tongue of each fits firmly into the slot of the other, care being taken to have the cambium layers in contact. If parts of the longer tongues extend beyond the point of union shorten them. The usual way of finishing this graft is to wind stock and scion with knitting cotton soaked in grafting wax. No. 18 darning cotton is strong enough to hold the parts but weak enough to break as growth begins.



Fig. 58.—Rabbits gnawed the bark off this tree but bridge grafting will make a new trunk. Notice the sturdy "bridges" across the wounded area

Grafting wax may be purchased at nurseries and seed stores. People who like to do messing can easily make their own. A good wax is made by slowly melting four pounds of resin in an old but clean pot over a gentle fire, adding two pounds of beeswax and one pound of tallow, stirring till thoroughly mixed and then pouring in a tub of cold water and when cool enough to handle pulling and kneading it till it looks like molasses taffy. For convenience it may then be made into balls or sticks. It will keep indefinitely. Grease will prevent its sticking to the hands. In cold weather it must be slightly warmed to make it work easily.

THINNING

With all due credit to pruning, cultivating and spraying, no one operation will so improve the size and appearance of fruit as thinning. This simple operation consists in cutting or plucking off 50 to 75 per cent. of the specimens while they are still green and letting them drop upon the ground. Among the reasons why it is so important are the following:

It maintains tree vigor because the energy which would be wasted in developing cull fruits is directed to the improvement of the better ones allowed to mature, and conserved by having to form a smaller number of seeds—the most exhausting process of tree life. These culls consist mainly of misshapen, diseased or insect-injured specimens. Thus thinning tends to make the trees bear with greater annual regularity, to improve size, color and quality of the fruit, to prevent breakage of branches due to overloads.

The work itself is very simple. Usually it should begin about a month after the petals fall or about two weeks after the trees naturally shed what they apparently consider excess fruits; but far too many fruits still remain as a rule. In order to know when the work is done it is necessary to be systematic, to start at one point and advance from the lower parts of the limbs to the tips and in a circle around the trees. Make the first rule to remove every defective specimen and the second to allow no specimens to remain so close that they will touch when full grown. This latter rule cannot always be applied, for to thin Seckel and other little Pears and many Plums that grow in clusters would be to leave too few fruits. Judgment, however, will grow with experience. Apple and large-sized Pear varieties are often thinned to eight and even ten inches apart by Western growers; Peaches to four or six. Never mind how strewn the ground looks. Probably you'll think you've taken off too many; but after two or three years' experience and observation the improvement in the fruit will prompt you to thin to an even greater extent.

Dwarf Fruit Trees

General Rules for Pruning and Training—Blossom Bud-Bearing Habits—Types of Training for Various Fruit Trees—Espaliers and Cordons

FRUIT trees may be kept dwarf in habit by pruning their branches to prevent the tops from growing to normal size, by restricting the spread of the roots either by root pruning or by growing them in tubs or flower pots, thus reducing the amount of available food and thereby reducing the size of the specimens, or they may be grown upon stocks of smaller growing trees or bushes which have a checking influence upon the trunks and branches. The last practice is in America the most common; it produces the "dwarf trees" sold by nurserymen.

The place for dwarf trees is in the family plantation where available space is too small to permit the growing of standard trees. On private estates where beauty of tree as well as fruit add to the pleasure of growing them, they also have a place. Besides the great advantage of their small size (Fig. 59) which thus permits of many varieties being grown in the same space that one standard tree would occupy, and also permit of being easily pruned, sprayed, and otherwise handled, dwarf trees begin to bear long before standards would normally start—often the second year after being planted. It is not necessarily true, however, that fruit produced by dwarf trees is of better quality than that produced by the same variety of standard tree, though this is a fact in the case of certain varieties. Tests conducted by the New York State Experiment Station at Geneva have proved that usually the specimens of Apple varieties grown as standards are better than those grown upon dwarf trees. With Pears the same observation holds good.

It is well to know the disadvantages of growing dwarf trees so that where space is not at a premium standards may be given the preference. Usually dwarfs are shorter lived than standards. They demand more attention as to pruning, fertilizing and cultivating than do standards in proportion to the amount of fruit they produce. Because propagation in the nursery demands more skill they cost considerably more than standards. Finally, comparatively few nurserymen who carry dwarf stock at all offer much selection as to varieties or devote the requisite attention to proper stocks upon which to bud or graft desired varieties, so that the trees they offer are not of as high quality as the standard trees of the same varieties they offer for sale.

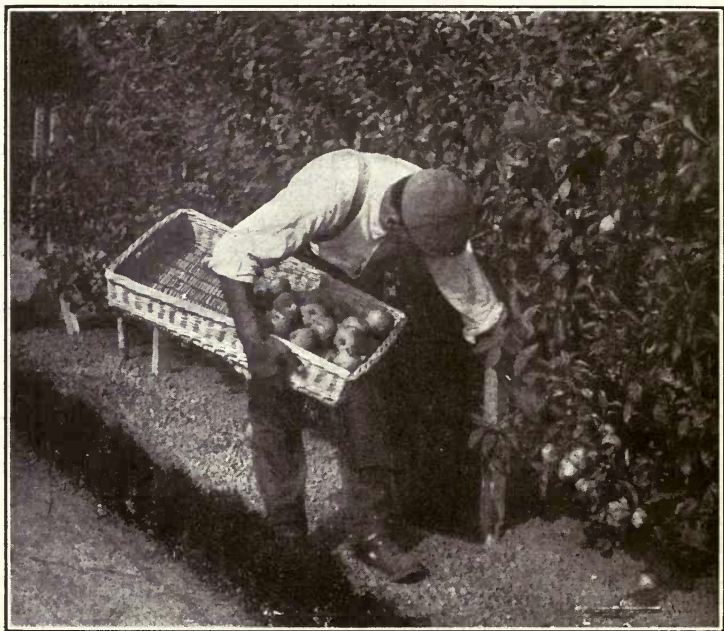


Fig. 59.—Dwarf Apples are easy to gather they are so near the ground

Dwarf trees may be trained in a far greater variety of forms than can standards (Fig. 61). They thus make special claims for attention where space is limited. The word standard is here used in its American sense; namely, a full-sized tree of its kind. In Europe a standard is a tree not artificially supported. Popular forms of self-supporting dwarf trees are bush, pyramid and globe; of supported ones, palmette, fan, gridiron and various styles of cordons and espaliers. A cordon is a "dwarfed tree trained to a single spurred stem for the development of fine fruit." An espalier is strictly a trellis, but the term is also applied to the trees trained upon trellises, fences or walls. While each of the tree fruits grown as dwarfs may be trained in any desired form, the following are the more popular ways of training the various species:

Bush and pyramid forms for Apple, Pear (Fig. 65), Cherry (Fig. 62), Apricot, Nectarine, Peach (Fig. 63), and Plum. The bush form, preferred for Sour Cherries, Apricots, Peaches and Apples, is the

most popular form of all since it demands least attention and yields the largest return in fruit. Pears do best as pyramids; Sweet Cherries and Plums also rather better than as bushes. A modification of the bush is the goblet in which the main branches or "leaders" are evenly spaced and trained to form a cup-like open head (Fig. 63).

Cordons (Fig. 64) are next most easily managed. Apples and Pears do specially well so handled. Strong growing varieties do better in U-shape or with two or more leaders, than as single uprights. Vigorous Peaches, Nectarines and Plums also do best in this form or in the double U-shape; the less vigorous ones do well as single uprights. Few are grown as horizontal cordons. Palmette and fan forms suit Apricots, Peaches and Nectarines; the latter also suits Pears and Japanese Plums. Gridiron, candelabrum and horizontal espaliers have proved satisfactory for most kinds of Pears and Apples.

The principal reasons for adopting any of these special forms except the bush, the pyramid or the globe are that the trees may be made to fit their surroundings, each main branch may bear fruit from end to end, the distribution of fruit may be made uniform both during one season and from year to year, and both larger specimens and finer quality may be secured than by the commoner forms of training.

With a clear knowledge of where fruit buds are normally produced a pruning program may be adopted to enhance such production. To check the growth of side shoots on Apple, Pear, Plum and Cherry

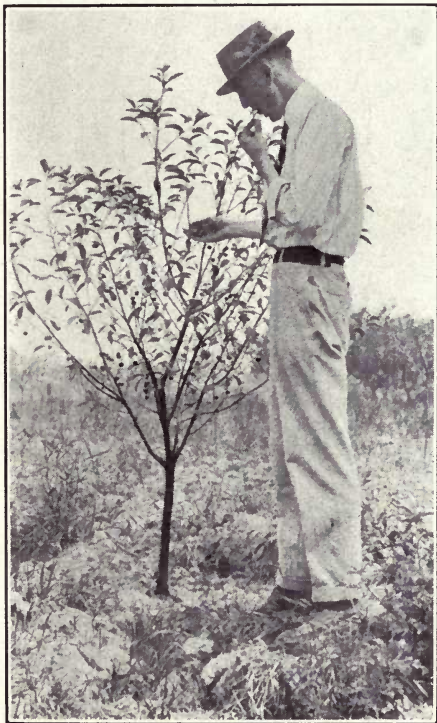


Fig. 60.—Doesn't this tempt you too? There'll be much more every year from now on



Fig. 61.—The dwarf Pear is easily trained to supports where space must be conserved

This method of bearing is not the principal one for the Peach. The great majority of the Peach fruit buds are developed on one year's leaders and side branches and expanded the following Spring. Japanese Plums and Apricots are betwixt and between the European Plums and the Peaches in production of fruit buds, some being upon spurs, some on the leaders and side branches of this year's development.

To limit the spread and the height of top the leaders are severely headed back during the dormant season, preferably toward the opening of Spring. This results in the development of many shoots which, during the growing season, must be either removed entirely or be pinched back to induce the formation of blossom buds. Both Winter pruning and Summer pinching are essential to best success with dwarf fruits. Root pruning is rarely practised except to check the growth of the most vigorous varieties.

"Leaders" are main branches that originate from the main trunk and terminate during the growing season in a twig of young

leaders during Summer is to induce the formation of buds that will blossom the following Spring. Not only will these blossom buds form as they normally do on short lateral fruit spurs one year old or older but also on wood of the current season's growth; that is, a year earlier than normally would be the case. Since fruit spurs are prone to bear only every other year, this development of blossom buds on growing wood is just so much gain towards regular annual bearing.

While Peaches and Nectarines often develop fruit on twigs two or three years old, these twigs are not like the spurs of the fruit trees just discussed, because they generally bear only once, then die.

wood which must be allowed to develop without any pinching so as to secure the maximum sap efficiency and healthful development. Only when a leader makes such prodigious growth that it monopolizes the food and energy that should go to the development of sideshoots—only then should it be cut during the growing season, preferably between mid and late June. Even then only a few inches of the growing tip should be removed.

Side shoots should then develop because they would get their fair share of food. Those that develop upon the leaders must always be pinched back during the growing season—during June and July, sometimes August—to develop fruit buds. The proper time to pinch shoots is when they have developed about six leaves. The amount to remove? All but three leaves. When other shoots develop on the pinched ones, pinch them back to two leaves as soon as three have formed. This is a regular annual process. It induces the formation of fruit spurs, fruit buds and fruit. When a main branch is allowed to rebranch and form a second branch each of these branches may be considered as a leader and so treated.

Should too many spurs form on the leaders, the superfluous ones—always the poorest or least favorably placed—should be removed when the dormant spraying is done. At that time cut back the annual growth of the leaders on young trees 50 to 75 per cent.; on old trees, or those which have about reached the desired size, cut back all but a few inches of the young growths on the leaders, leaving only two or three



Fig. 62.—Dwarf Cherries begin to bear while very young

buds beyond the point where the previous dormant pruning was done. This cutting, while it looks like butchery, is absolutely essential to keep the trees within bounds. Should too many fruit spurs develop as the trees grow older the inferior ones may be removed when the dormant pruning is done. When managed as outlined the trees should begin to bear the third Summer, sometimes the second after planting.



Fig. 63.—Dwarf Champion Peach. Just coming into bearing the second year after planting

GENERAL RULES FOR PRUNING AND TRAINING

1. One year dwarf trees are usually unbranched "whips" or "switches" two to three feet tall, sometimes more, sometimes less; two-year trees are usually about the same height but they are more or less branched. Some nurserymen furnish one-year trees when they run out of two-year plants. Two-year trees are generally preferred to one-year, but the latter have the advantage that the head may be started at just the desired height, whereas the former cannot be changed without risk of damage to the tree.

2. If newly Fall planted in the North, do no pruning until late Spring just before the buds begin to swell. In the South, where winters

are short and mild, preliminary pruning *may* be done when the trees are planted but there's no special advantage in so doing.

3. Always have the pruning tool very sharp! A knife is better than a shears for almost all the pruning to be done on all kinds of dwarf trees. Only when a large branch is to be removed will the saw or the two-hand shears be needed. The single hand shears if

very sharp may be used instead of the knife, but it does not do quite as nice a job. All pruning of leaders and spurs (twigs) must be with an oblique cut slightly above a sturdy bud, never with a long stub (Fig. 34C). The direction of growth may be somewhat modified by the position of the bud—up, down or to right or left.

4. Remember that leaders are branches which form the tree framework whether this consist of one or many branches. These leaders must grow all season without check except when they are monopolizing the food and preventing the growth or development of spurs (side shoots for fruit bearing). Leaders are pruned to desired shortness before the buds begin to swell in Spring.

5. Whenever a restricted height is to be maintained, as in all special forms of dwarf-tree training, cut the leaders back 25 to 50 per cent. the first year or two and when the height and spread approach the desired dimensions cut the previous season's growth back to a five or six buds. Only by such cutting can the trees be kept the desired size. Judgment is necessary in this case; for where the growths are strong more wood and buds may be left than where they are weak. Severe pruning in Winter tends to make wood since it forces all the food into a smaller number of buds. Summer pruning checks wood growth and favors fruit bud formation.

THE BUSH FORM (Fig. 62).—When the newly set trees are "whips" they may be cut back so the highest bud left will be at the height of the highest leader to be developed directly from the trunk. Buds below this one will also develop branches which must be allowed to grow without any cutting until the following Spring, though puny and badly placed ones that would never do for leaders may be cut off during the growing season, say in early June. From the balance the desired number of leaders may be chosen and cut back 50 to 75



Fig. 64.—A Cordon dwarf Apple

per cent. late the following Winter. When two-year trees are bought the selection of leaders is the same as just indicated.

The uppermost bud will grow more vigorously than any of the others and if erect more in continuation of the original direction of growth. Side shoots will develop from both last season's and this year's growth. These must be pinched as indicated on page 79. When too few branches are formed on the two-year tree all those that have formed including the main trunk may be cut back to the lowest bud or two so as to force the development of a new set and larger number of branches. Leaders of strong growing varieties will need to be pinched. What ones can easily be determined by their making growth out of proportion to the others. One must use his own judgment as to the amount to pinch. Every season the dormant pruning and the Summer pinching must be done—a few minutes only are needed each time if the work is done regularly.

THE PYRAMIDAL FORM, used mainly for the Pear, is developed as follows: The one-year whip is cut back before the buds start in Spring to leave about twelve inches if the whip is sturdy, ten, eight or even six if weak. The uppermost bud will develop the leader which must not be Summer pinched unless it is robbing the others of food, that is, growing too sturdily. The other shoots must have their tips pinched. When the uppermost side shoot (leader), grows much stronger than the lower ones, as is usually the case, it must be pinched back early in the season, perhaps in late May. The one next to it may be pinched a couple of weeks later and so on down till the lowest one is pinched latest in the season, perhaps not till mid-July or early August. This method tends to balance the strength of the branches.

During the Summer, as undesired twigs appear below the lowest desired branch, rub them off with the hand while still very small. Leaves on the trunk should remain. Any side shoots that may develop on the leaders must be pinched back as already indicated. Should they be growing slowly their ends must be pinched during late June, regardless of their length.

Dormant pruning before the buds start during the second Spring is practically a repetition of the first year's dormant work. The young growth of the main leader is cut back 50 to 75 per cent., the cut being made where it will favor upward growth of the erect stem from the uppermost bud. Lower buds on the leader will develop side shoots which must be treated as those of the previous year were handled. The idea is to have the lowest leaders longest, the uppermost ones the shortest as the tree grows older. Side shoots on all leaders are pinched back as the previous year.

Each year the dormant pruning is repeated as just outlined,

the lowest lateral leaders being cut back a little, each one higher up perhaps more and the vertical stem or main leader most so as to maintain the pyramidal outline of the tree. A good proportion for a pyramidal tree is a spread of the lowest branches about one-third the height. The height and the size of the tree may be kept practically the same after, say, five to ten years by the amount of dormant pruning given the leaders.

THE PALMETTE FORM is never used where the trees must stand alone, only when trained to a stake, upon a trellis, against a wall or a fence. Pruning of the newly set tree is as indicated for the pyramid. The uppermost bud will form a new leader; the two best placed but opposite buds that develop into shoots below this must be fastened obliquely upward on opposite sides of the main stem. All other shoots must be cut off close to the trunk. No other arms must be allowed to form the first season, side shoots on all the young growths being pinched back as already indicated in discussing the pyramid. No other attention is necessary the first season unless the vertical leader is growing too rampantly, when its tip may be pinched back to favor the two secondary or oblique two leaders.

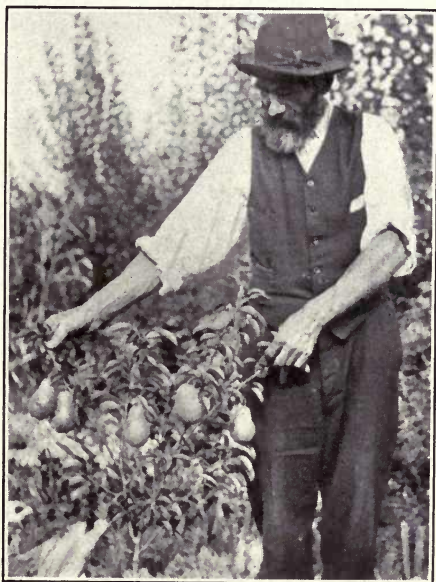


Fig. 65.—The second season after planting a dwarf Bartlett Pear tree

Before the buds swell the second Spring cut off all but about a foot of the principal or erect leader (8 or 10 inches may often do) above the oblique leaders (arms, they are often called). Let the uppermost bud develop a new vertical leader, and the two best placed opposite ones as nearly as possible immediately above the two oblique leaders already developed. During the growing season pinch back the small laterals and cut off superfluous ones as before. These processes are repeated year after year so that in time half a dozen to a score or

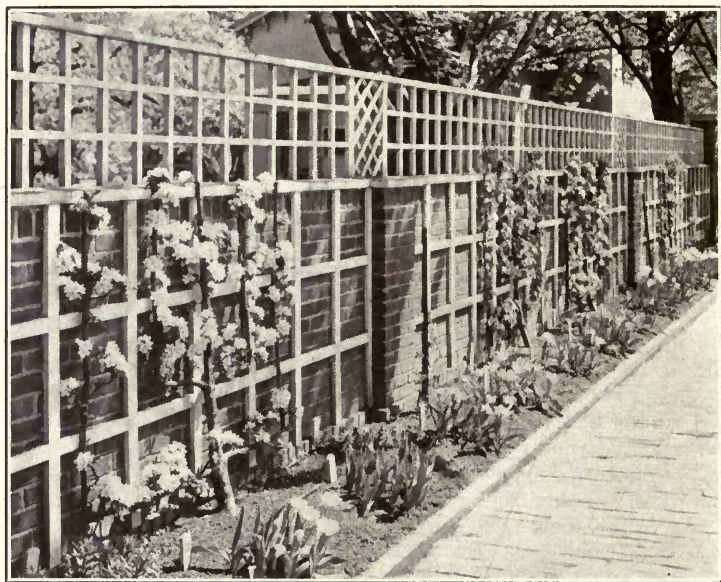


Fig. 66.—Wall training is a beautiful way to grow dwarf fruit trees

more oblique arms are developed from the main stem. The height and the spread of the palmette may be governed by the amount of dormant pruning done from year to year. Each of these arms may be made to branch as desired.

THE FAN FORM is started from a "whip" cut to a stub at eight or ten inches from the ground before the buds swell. Among the shoots that start those favorably placed are saved, others cut close to the main stem. While the fan may ultimately have eight or ten arms only four to six may be available the first season. Each sprout to be saved must be fastened as early as possible to the trellis in about the position it is to occupy when fully grown and be allowed to extend without hindrance except when one is growing at the expense of the others. The side shoots that develop upon it, however, must be pinched back as already indicated. All unnecessary growths on the main trunk must be suppressed.

Before growth starts the Spring after planting the leaders must be cut back to six or eight-inch stubs from which to develop new branches. From these the desired number of leaders may usually be secured—two from some and one from others. Fastening the new

growths to the trellis, cutting off unnecessary ones and pinching off side shoots are the same as during the first season. As the desired shoots grow into leaders the development must be kept uniform by pinching the tips of any that grow too rampant. From the end of the second season forward, Summer pinching and dormant pruning of Apples, Pears, Cherries and Plums are the same as in the other methods described.

Peaches, Nectarines and other trees which bear their fruit buds on last year's growths need a little different handling, thus: When the dormant pruning is done the second Spring and each year thereafter the leaders must be cut back more or less to insure the growth of side shoots. Most of these must be pinched back, but a few—two to five or six—on each leader must be left to become side branches to fill in spaces between the main leaders thus to make an unbroken fan. They will also be needed to bear fruit buds. It is necessary to allow plenty of side shoots to develop on Peaches and Nectarines, each year, for old wood produces no fruit. So when an arm begins to fail in fruit bearing or when the fruit buds are borne far out it must be cut back severely to some point where a vigorous growing shoot may be left to take its place.

CORDONS, or branchless but "spurred" stems, are trained vertically, obliquely or horizontally in single U-shaped and double U-shaped forms. The upright is the simplest. The "whip" is cut to eight inches and one shoot allowed to grow vertically without any check. All other shoots are suppressed. Side shoots on the leader are pinched back as already indicated. Should more shoots be needed than have formed by early Summer they may be forced by pinching back the leader tip. In the Spring the young growth of the leader must be cut back 50 to 75 per cent. Similar shortening must be done each Spring till the leader is nearing full size—six or seven feet tall. Then the cutting is made just above the lowest bud on the new growth. When dormant pruning is done all unnecessary spurs and short branches are cut off.

OBLIQUE AND HORIZONTAL CORDONS are managed exactly like upright ones except that they are trained and fastened in the desired position while young. U and V shaped cordons are managed like upright ones except that two leaders are grown instead of one. The arms for the U are first trained horizontally 10 or 12 inches apart. The double U form is simply two U's developed from one.

CHAPTER IX

Insect and Disease Control

Biting Bugs, Sucking Bugs and "Sappers and Miners"—
Poison Sprays for Biting Insects—Contact Sprays for Sucking
and Soft Bodied Insects

IT ought certainly to be reassuring to the amateur fruit-grower who has been reading the fat tomes on bugs to learn that, so far as control is concerned, insects may be lumped in two general classes: the ones that nibble and swallow little pieces of plant tissue, and those that pump the juices precisely as a mosquito helps himself to human gore. Here is not only the distinguishing point between the bugs, but also the deciding one as to the method of fighting all except those that burrow beneath the skin of the leaf, or the bark of the trunk and limbs.

The bugs that bite off and swallow pieces of leaves—beetles, grasshoppers and caterpillars—are most easily controlled by poisons which they take into their stomachs. They are the easiest to get rid of because the poison may be spread upon the threatened parts somewhat

in advance of their arrival, then when they do arrive they will promptly depart. The sappers and miners—Peach and Apple borers—which constitute a subdivision of the chewers cannot be effectively controlled by poisons, simply because they have burrowed beyond the reach of such materials. Like military sappers and miners, they must be met on their own ground—fought in their own tunnels where such methods are feasible.



Fig. 67.—When the "shucks" begin to fall off the Peaches is the time to spray

Bugs that suck, such as plant lice and leaf hoppers, are the hardest to fight. They are not affected by poisons because they do not take such materials into their stomachs—nothing but plant juice! Caustics, oils, poisonous gas and other materials that kill them through their

skins or breathing apparatus are the only effective remedies for them. Such being the case, except where gas is used, each individual bug must be hit with the insecticide or it will continue to feed as unconcernedly as if no spraying at all had been done. But here's a reassuring thing: The amateur is likely to do better spraying of the plants he owns than is the hireling on a big fruit plantation, and by being on the *qui vive* for attacks the work is likely to be done at the proper time.

In a book of this kind space is not available to discuss either the common insects or diseases. What is more to the point is a brief presentation of the means of control. Should any reader wish to identify insects that interest or give him trouble he should send a few living specimens, with some of the food, plant in a wooden or metal box, to the "Entomologist," at the Experiment Station, or Department of Agriculture at Washington. Inside the box he should place his name and address, and in a letter sent separately describe the work of the creatures, name the plant they are feeding upon, and ask such advice and information as he may need.

In a general way plant diseases may be grouped as physiological, bacterial and fungous. Fortunately, many of the first are preventable, or even curable, by good cultural care. Yellowish foliage and puny twig growth usually indicate lack of nitrogen. Unfortunately, the other groups of maladies cannot be as simply dealt with as can the two classes of bugs. Spraying must be preventive: the spray material must be on the leaf before the disease would normally make a start.

The hints given concerning fungicides will cover the majority of cases, but where results are not satisfactory write and send specimens to the "Plant Pathologist" at the Experiment Station, or the Department of Agriculture. One notable exception is the blight of Pears, Quince and Apple, a bacterial disease worst on the Pear. This appears first in the Spring as brown leaves among the green. It spreads down the twigs to the branches and even the trunks. Every week from the time the flowers appear the trees should be inspected and the diseased



Fig. 68.—After the petals fall and while the sepals are open is the time to spray Apples and Pears for coddling moth

twigs removed and burned. Just as a surgeon sterilizes his instruments so the knife used must be sterilized. If the wood is healthy looking where cut, well and good; but if there is a brownish discoloration below the bark a new cut must be made lower down. The discoloration shows that the disease has worked lower down than the cut. Remember: Sterilize the knife *every time* before making the cut. A tablet of corrosive sublimate in a pint of water is the sterilizing solution which may be applied with a sponge or a rag. It is a deadly poison and must be kept where it will not be reached by children or pets.

Before spraying for anything be sure to know whether it is a bug or a disease. If a bug know whether it sucks or chews. Then be thorough. For medium-sized gardens and orchards a knapsack spray pump and the portable compressed air sprayer (Fig. 69) are very satisfactory; for little ones and small plants the squirt-gun styles may answer. Areas larger than a quarter of an acre are easier to manage with a barrel sprayer. In choosing such an apparatus give preference to one lying on its side to one standing on end, because when so mounted the pump is lower, there is less danger of its catching in branches and being tipped over, and the sediment settles immediately below the pump and is removed before it gets abundant or hard. For the



Fig. 69.—The compressed air sprayer is a handy affair for tree as well as low spraying

family orchard it will probably not pay to get a gasoline power-spraying outfit, even though the engine may be disconnected and used for other purposes such as sawing wood, churning, making ice cream and as a substitute for the hand that rules the world—via the cradle.

Such materials as arsenate of lead, Paris green, hellebore, and nicotine preparations must be bought. Certain others, such as lime-sulphur wash, may be purchased or made at home. This stuff is, however, so unpleasant to make that it had better be bought.

There are many brands. They should be bought and used upon the basis of specific gravity. Bordeaux should always be made at home because it is simple to prepare and is more effective when freshly mixed. Kerosene emulsion may as well be made at home as the process is simple and there is little danger of making a mistake. There are many proprietary preparations, such as Scalecide, Pyrox, Sulphocide, many of which justify the claims of their makers.



Fig. 70.—An extension rod makes the bucket pump serve for tree spraying

POISON SPRAYS FOR BITING INSECTS

Arsenate of Lead.—Two forms, paste and powder differing in composition, the former preferable, better than Paris green as it does not usually injure foliage and sticks well and long. As the commercial brands vary in strength, apply according to manufacturer's directions as to quantity.

Hellebore.—A whitish powder made from the roots of the plant. Must be fresh and kept in a tight receptacle as it quickly loses strength. Not poisonous to human beings. May be used shortly before fruit ripens. Usually applied dry while the plants are moist with lime dust, sifted coal ashes or cheap flour at the rate of one to three parts, or sometimes steeped in warm water, one ounce to the quart, and diluted with another quart when cold.

Paris Green.—Hard to keep suspended in water, likely to burn foliage unless lime is added to the mixture. Rate, four ounces to one pound of quicklime and 50 gallons of water.

CONTACT SPRAYS FOR SUCKING AND SOFT-BODIED INSECTS

Tobacco Sulphate, Black Leaf 40, Nicofume, preparations of waste tobacco, specially recommended for plant lice or aphids.

Soaps.—Laundry soap, one pound to five or six gallons of water, and soft soap twice as strong, also used for aphids. Whale oil soap, two pounds to one gallon of water in Winter and one to five or six in Summer, is better, especially if made of potash instead of soda.

Kerosene Emulsion.—Dissolve one pound of laundry hard soap in two gallons of hot water. When dissolved and while still hot pour in four gallons of kerosene and churn the liquid with a paddle, or preferably a small hand-spray pump, till the mixture is creamy and cool. It will be semi-solid when cold and will keep indefinitely. This quantity when diluted with 34 gallons of water will make a 10 per cent. solution, useful for Summer work; when mixed with 14 gallons a 20 per cent. and with 10 gallons a 25 per cent. solution, useful while the trees are dormant.

Carbolic acid solution is made by dissolving one pound of hard soap in one gallon of hot water and when fully liquified adding one pint of crude carbolic acid, then churning as suggested for Kerosene Emulsion. Before applying to foliage add 30 gallons of water.

Lime-Sulphur Wash.—Better buy it made because of the varying strengths of the material. Be sure to know the strength of the one bought and dilute accordingly. The dilution will range from one gallon to five of water—a very strong one used for San José scale during Winter—down to one to twelve, the comparatively weak mixture used for blister mite of Pear. Lime-sulphur has also an important fungicidal action.

Miscible oils, those oils that mix readily with water, are useful only on dormant trees for killing scale and similar insects. They are much less disagreeable than lime-sulphur to apply. They also have a greater "spreading" power, thus being effective in a wider area.

Bordeaux is most conveniently made from "stock solutions" as follows: 1. In a clean barrel place a certain number of pounds of quicklime. Upon this throw water in measured quantity, little by little, and stir constantly until the lime has all dissolved and the mixture is about as thick as cream. Then add enough more water to have a total equal to the number of pounds of lime. For instance, if 25 pounds of lime are used, use a total of 25 gallons of water. Stir up this solution and strain through a fine mesh sieve or a cloth to remove all particles. Cover the liquid with a pint or more of kerosene or naphtha to prevent evaporation.

2. In another barrel, perfectly clean, place a certain number of gallons of water. Then hang an equal number of pounds of copper sulphate in a burlap bag so the bottom of the bag is only slightly below the surface of the water. If this is done in the evening the whole of the sulphate should have dissolved before morning, but if the sulphate is placed in the bottom it may take a month or more to dissolve. Pour

some kerosene or naphtha on the solution. Use wooden or earthenware receptacles for the liquid because metal ones (except copper and brass) are ruined by copper sulphate.

3. When Bordeaux is to be made, pour the required quantity of stirred-up lime solution into an empty barrel and the required quantity of copper sulphate solution into another, and dilute each with water until the quantity in each barrel is half that required for the completed mixture.

4. Through a hose attached to the bottom of each of these barrels



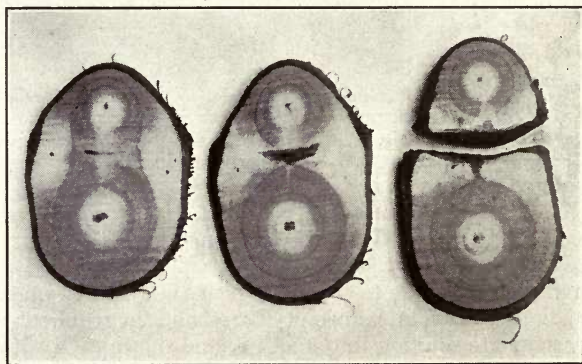
Fig. 71.—For fairly large orchards a barrel may serve all spraying needs

allow the diluted liquids to pour into the spray tank, or barrel, so that each stream will strike the other as it falls. This makes the finest kind of mixture.

5. To make sure that the completed solution contains no "free" copper sulphate place a spoonful on a plate and let a drop of ferrocyanide of potassium (yellow prussiate of potash), dissolved in water, fall into the sample. If a reddish-brown color appears add more lime solution, stir up thoroughly and test again. If none is noticed the mixture is safe to use.

One Bordeaux formula is four pounds of copper sulphate, four pounds of lime to 50 gallons of water. That is four gallons each of the above stock solutions with 21 gallons of water in each of two barrels. These poured together would make 50 gallons. As this formula is too strong for Peaches, Plums and Cherries, the following is used: three pounds sulphate, three of lime to 50 gallons of water.

Self-boiled lime-sulphur wash is made by placing eight pounds of quick-lime in a barrel with eight pounds of sulphur on top, then adding boiling water, little by little, stirring constantly until the lime is slaked and becomes about like cream, and then allowing the mixture to cook by its own heat for fifteen minutes, the barrel being kept covered with burlap to hold in the heat. When "done" add enough water to make 50 gallons. This mixture is specially useful against brown rot of stone fruits. It is useless for fungi during Winter, on San José scale at any time, but it is safer than commercial lime-sulphur against fungi during the growing season.



These cross sections of a Y-crotch show decay works its way downward and weakens the union until a break follows. The dark spots show the progress of decay

Storage of Fruits

Construction of the Outdoor Storage Cellar—Types of Storage Houses in the North and the South—Storage in Banks or Pits

THE house cellar of my boyhood was ideal. It was stone walled and brick paved and had wide inside and outside stairs without a turn and with very easy grade, a sloping trap door over the outside one and a thick, heavy, insulated one, internal tight board shutters on the windows, prison barred, (through which boys could see but not reach the forbidden fruit,) and it was large enough to serve a young hotel without strain. But in spite of the fact that it contained no heater, the plan being to keep the house above freezing by stoves and fireplaces, it was considered too warm because of the kitchen fire above, so no more than a couple of weeks' supply of perishable fruits and vegetables was kept in it at a time, the main supply being stored in the "outside cellar" (Fig. 72).

From experiences with other cellars in which hot air, hot water and steam house heaters are placed I know it is useless to try to keep fruits or vegetables in such places. The air is so dry and so warm that shrivelling and rotting are the certain results. When the original house plan has not included a storage cellar, it is often



Fig. 72.—Entrance to outside storage cellar

possible to partition off a part of the general cellar at one end or one corner, or to cut a door in the wall and make an excavation outside for one. As I have never had to build such a cellar I quote the following somewhat condensed suggestions from J. H. Beattie in *Farmer's Bulletin* No. 879:

"At least one window is necessary, two or more are desirable for light and ventilation. If the cellar is square or rectangular, a room similar to the one illustrated in Figure 73 can be arranged in one corner. If built L-shaped it should be made by partitioning off the offset, as shown in Figure 74. In some cases one end of the cellar may be cut off with one straight wall.

HOME FRUIT GROWER

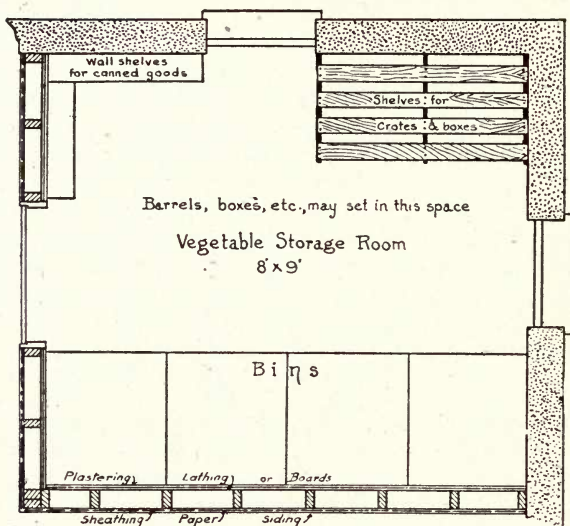


Fig. 73.—Floor plan of a vegetable and fruit storage room in the corner of a basement. The arrangement of the shelving and bins may be changed to suit conditions. While the construction of the wall may be varied, it must be tight

“The size of the storage room should be determined by the space available and the amount of material to be stored. Natural earth makes a better floor than concrete or brick, as a certain amount of moisture is desirable. (Brick being porous is better than concrete.) The walls of the storage rooms should be parallel to the walls of the cellar.

“Lay 2 x 4 inch scantling flat on the floor and secure them by pegs driven into the floor or by nailing them to the top of short posts set in the ground. Set 2 x 4 inch studding from this sill to the ceiling, spacing them 16 inches apart from center to center. Locate the door at the most convenient point, making it large enough to admit barrels, boxes, etc., a good size being two and one-half feet wide by six and one-half feet high. Set the studs on either side of the door 32 inches apart, to allow for the door and the frame. Put a header over the door, allowing one inch for the frame and seven-eighths of an inch for the sill at the bottom. Set the studs against the walls where the cellar walls and the storage walls meet. Care exercised in making the frame square and plumb will enable the builder to get the structure tight with a minimum of labor.

"A good room is made by covering the studding on the outside with tongue-and-groove material, but a better way is to sheathe the outside with plain lumber, tack building paper on this, and side with tongue-and-groove material. This construction in connection with lath and plaster or wall board on the inside makes an excellent room.

"Ventilation may be secured by opening one or more windows. An air duct of wood, metal, or terra cotta fitted in one of the window panes (Figure 75) is desirable, as it permits the cool air to enter at the bottom of the room. Two or more joints of six-inch stove pipe, one with a damper and an elbow may be used. Another pane may be removed and a small-hinged door fitted in its place. When open this will allow the heated air to escape. In cold weather both door and damper must be closed. The windows should be darkened (as light is unfavorable to keeping fruits and vegetables).

"Movable containers are preferable to built-in bins, as it is possible to remove them for cleaning. It is advisable to construct shelves

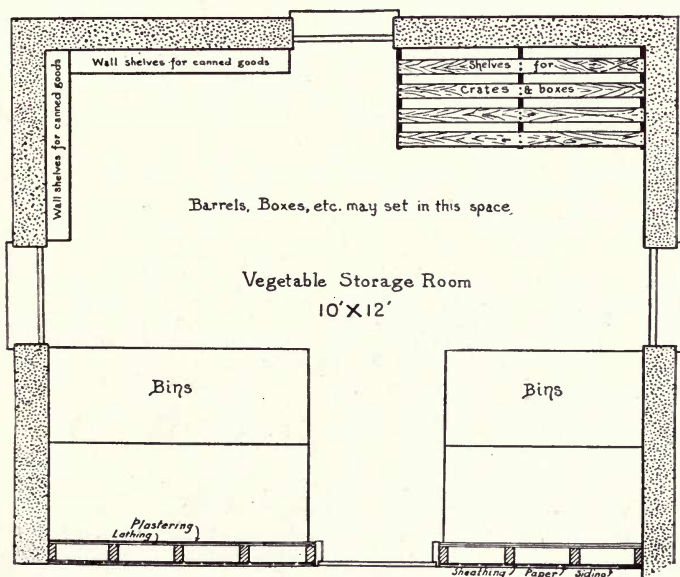


Fig. 74.—Floor plan of vegetable and fruit storage quarters in house cellar, showing possibility of constructing such a room by partitioning off a portion of the cellar under the wing of the house

or a slat floor to keep the crates, boxes and baskets off the ground, to insure a free circulation of air and to prevent the containers from harboring mice, rats, and other vermin. The shelves for canned goods along one side of the room need not be more than six inches wide."

The house in which I now reside has a room 6 x 9 feet separated from the main cellar by the foundation wall and an ordinary tongue-and-groove single door. Though small it is adequate for the needs of my family, now reduced to three. A double, insulated door

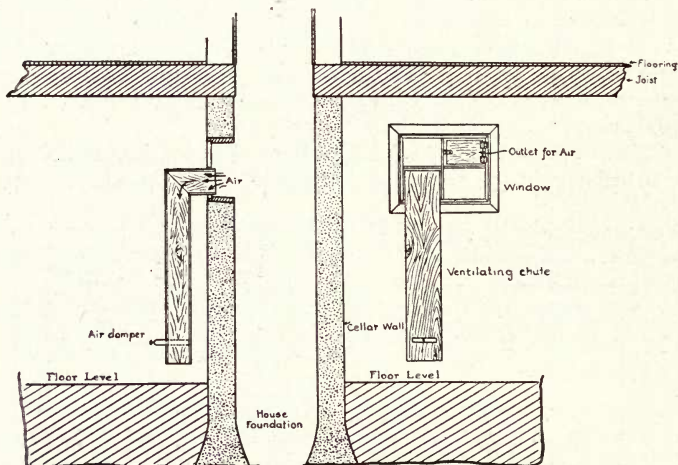


Fig. 75.—Details of construction for the ventilation of a storage room in a basement. The air duct may be made of wood, terra cotta, or metal and installed in place of a pane of glass, thus avoiding cutting through the cellar wall. A hinged door the size of another pane of glass may serve as an outlet for warm air

would greatly improve it as the hot water heater is located in the main cellar.

One of my neighbors has partitioned off a part of the north side of his main cellar room with wooden walls filled with sawdust or planer shavings. To regulate the temperature he admits cold air through a stovepipe, which, unlike the chute shown in Figure 75, discharges near the floor on the warmest side of the room near his hot-water house heater. An ordinary smoke damper regulates the inflow of air. This is a good plan, especially where the partition wall is large and the balance of the cellar warm.

Such little cellars as mine, while very handy and good are too small to hold the product of even one full-bearing Apple tree, to say nothing of vegetables, canned goods, meat, eggs and other supplies for an ordinary sized family. Since the construction of a storage cellar beneath a dwelling already erected becomes more and more undesirable as its size increases, both because of the cost and the possibility of tainting the air upstairs, it becomes more and more important, where a larger quantity than a barrel or two of fruits and vegetables must be kept to have a separate storage building.

Outside or separate storage cellars are almost necessary where the quantities of fruit and vegetables to be stored are large enough to



Fig. 76.—Style of storage house popular in the South where the temperature does not go very low

supply a family of four or more from, say, November to March or April. They are especially desirable on farms since they furnish inexpensive and convenient facilities for saving surplus crops that might otherwise spoil. Though they may not have all the advantages of storage room in the house cellar they excel such rooms in being more easily chilled and kept cold during long periods. By opening the door, the windows and the ventilators in the evening and closing them in the morning, whenever the outside temperature is lower than the inside, the storage room may be kept colder than the day temperature and the fruit made to keep well. Whenever the day temperature outside is lower than that inside the cellar the door, windows and ventilators should also be opened, the idea being to take advantage of every fall of temperature to lower that of the fruit. This opening may continue until the outside temperature goes down to, say, 30 to 28 degrees, that is, two to four degrees below freezing point, for Apples and Pears are not injured by so slight a degree if in close packages and if the duration of this temperature is only a few hours.

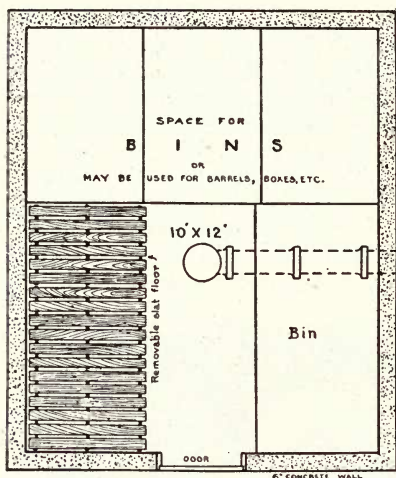


Fig. 77.—Floor plan of a simple concrete storage cellar which may be used for Apples and other fruits. The floor is of earth, but the barrels, crates, etc., used as containers, are set on a slat floor. Bins decay so quickly that movable receptacles are usually preferable

If vegetables and fruit must be stored under one roof they should be kept in separate and insulated compartments, each with its own ventilators.

CONSTRUCTION OF THE OUTDOOR STORAGE CELLAR

“As the cellar must be kept free from moisture and free from frost,” writes Mr. Beatty, “its type and construction will vary with the geographical location. In the South the structure is usually entirely above ground and protected by only a few inches of sod, straw, leaves, etc. (Fig. 76). In the North outdoor storage cellars are made almost entirely below ground and covered with a foot or two of earth.

“The former may be built on a well-drained site at slight expense. A row of posts may be set five or six feet apart, extending seven or eight feet above ground with a ridge pole on top of them. Against each side of the ridge pole planks or puncheons are placed in a row, their opposite ends resting in a shallow trench four or five feet from the line of posts. The ends are boarded up, a door being provided in one and the roof covered with five or six inches of sod.

“In sections of low temperatures it is necessary to insulate the storage house to prevent freezing. An above-ground type of house, popular in the North, has thick walls filled with insulating material such as sawdust or shavings. The construction is of frame and the walls are usually ten or twelve inches thick. Both inside and outside walls are sheathed with matched lumber to make them air-tight. The rafters are similarly ceiled on the under-side and the space between the rafters filled with dry insulating material. Building paper in the roof and walls is of great assistance in insulation. Ventilation is secured through a flue in the roof and an air inlet in the floor (Fig. 77).

“A type of storage cellar much used in Northern sections is built partly underground. The masonry walls extend to a point just

above the surface of the ground. On these walls plates are set and a roof of frame construction erected. The roof structure is ceiled on the under side of the rafters and dry sawdust or shavings packed in the space between the rafters, and then the sheathing, paper and roofing material. This type of structure is preferable in many respects to the above-ground type, as it is easier to maintain the temperature at the proper point and its insulation is a comparatively easy matter.

“Protection from freezing may be secured with an entirely underground structure. In order to avoid steps down to the level of the floor, with the consequent extra labor in storing and removing the vegetables, a side hill location is desirable (Fig. 78). The excavation

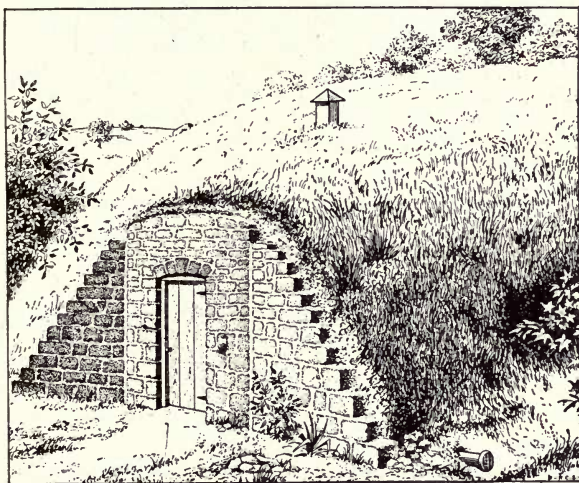


Fig. 78.—Outdoor view of a side hill fruit storage house

in the hill should be of the approximate size of the cellar, using the dirt for covering the roof and for banking the sides. A frame is erected by setting two rows of posts of uniform height in the bottom of the pit near the dirt walls and a third line of posts about 5 feet higher through the center of the pit. These posts serve as supports for the planks or puncheons forming the roof. The door is placed at one end and a ventilator in the roof. The whole structure with the exception of the portion occupied by the door is covered with dirt and sod. The thickness of the covering must be determined by the location; the colder the climate the thicker the covering. Out-

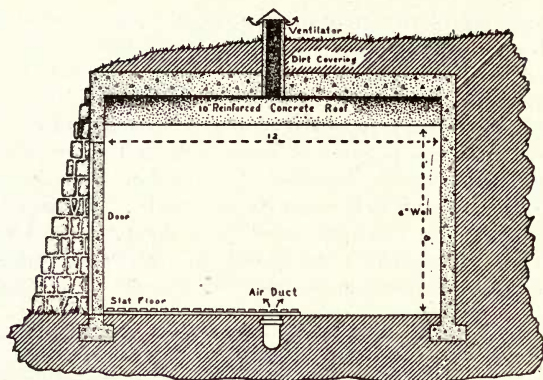


Fig. 79.—Longitudinal section of an outdoor storage cellar, 12 feet long, built of concrete. The structure may be lengthened to increase the storage capacity, but additional ventilators must be provided

side storage cellars usually are left with dirt floors, as a certain degree of moisture is desirable. These cellars may also be made of concrete, brick, hollow tile, stone, or other material.

"The type of outdoor storage cellar just described, while low in first cost, is short lived, as conditions are favorable to decay. The concrete storage cellar, although higher in first cost, is permanent. In the construction of a small structure suitable for the home it is possible to make the roof self-supporting and to employ unskilled labor, thus lessening the cost. It is a simple matter to waterproof concrete, a feature highly desirable in a storage cellar.

"The site for the concrete storage cellar should be selected with the same considerations in mind as for the wood frame cellar, namely, a well-drained, convenient location, preferably a side hill, into which it may be built as shown in Figures 79 and 80. The excavation should be just large enough for the dirt walls to serve as the outside form for the concrete. For that portion of the wall which is above the surface of the ground a board form must be used. The inside form usually is made of boards held in place by scantling spaced about 18 inches apart. Temporary supports should be placed across the top to carry the form, so that it will be of the size and shape desired.

"The side walls and roof should be so constructed that there will be no joints to weaken the structure. The form for the ceiling may be slightly arched by setting a temporary line of posts through the middle of the excavation. A plate placed on these posts a few

inches higher than the height of the side walls will allow the form boards to be laid crosswise of the cellar, springing the ends down and securing them to the inside of the walls. An arch a few inches high makes a strong roof and helps in ventilating the cellar.

"The whole structure, with the exception of the portion occupied by the door, is covered with earth to prevent freezing, the thickness of the earth covering depending upon the geographical location. In the colder sections of the country two or three feet is not too much. In severely cold weather both the top and bottom air ducts must be closed. It is well to cover the outside ends of the air inlets with woven wire to prevent small animals from entering.

STORAGE IN BANKS OR PITS

"Outdoor banks or pits for Apples are constructed as follows: A well-drained location should be chosen and the product piled on the surface of the ground; or a shallow excavation made of suitable size and six or eight inches deep, may be lined with straw, leaves, or similar material on which the fruit is placed in a conical pile and covered with straw or similar material and finally with earth to a depth of two or three inches. As Winter approaches, the dirt covering should be increased until it is several inches thick. The depth of the earth covering is determined by the severity of the winters in the particular locality. It is well to cover the pits with straw, corn fodder, or manure during severely cold weather.

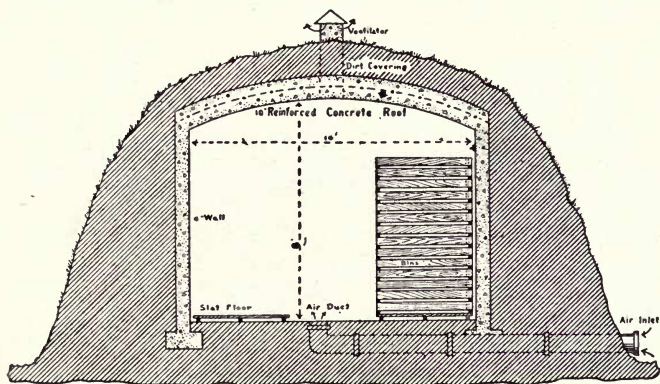


Fig. 80.—Cross section of concrete storage cellar, showing arrangement of ventilators, slat floors, and bins, with provision for the circulation of air under and around the slat floors and bins. This cellar is 10 feet wide and 8 feet high, inside measurement

"The amount of ventilation necessary will depend upon the size of the pit. Small pits containing but a few bushels of fruit will receive sufficient ventilation if the straw between the fruit and the dirt is allowed to extend through the dirt at the apex of the pile. This should be covered with a board or piece of tin held in place by a stone to protect it from rain. In larger pits ventilation may be secured by placing two or three pieces of rough boards or stakes up through the center of the pile of Apples so that a flue is formed. This flue is capped by a trough formed of two pieces of board nailed together at right angles.

"Apples keep well in such pits, but it is difficult to get them out in cold weather, so that when a pit is opened it is desirable to remove its entire contents at once."

Even as a boy I never liked the pit storage method because the fruit always tasted earthy and in Spring had to be used very soon or it would spoil. The former fault I have been told may be prevented by constructing a roof of branches or boards to keep the straw and earth several inches above the fruit so a large air space would be formed. Be that as it may, I prefer other plans.

For storage in ordinary house cellars, especially ones not as cold as they should be, Apples and Pears are often wrapped in paper. We have had good success with this method. It is not necessary to buy commercial fruit wrappers, handy though these are and even though they usually cost less than 50 cents a thousand sheets. Newspaper pages cut in four will do for medium-sized Apples, but for large fruits the sheets should be about a foot square. Each fruit is placed in the center of a sheet and the paper brought around it. Then the fruit is put in a box which for convenience in filling is tilted. The boxes need not be filled as snugly nor as full as for shipment. Those to be kept longest should be covered and placed in the coolest place in the cellar—on the floor. Wrapping prevents wilting, reduces changes of temperature, retards ripening, checks the spread of decay and disease and prevents bruising.

No matter what plan of storage be adopted it will pay to store only the good specimens—those not wormy, bruised, decaying (even the least bit) and free from diseases that may spread in storage and ruin the fruit. Better err on the safe side and avoid storing any doubtful specimen, for it is not merely the one specimen that will suffer; all that touch it may become infected and spoiled.

Grapes may be kept successfully from several weeks to several months, provided the family appetite will let them. It never did when I was a boy, but that was because there was too much boy. Whenever attempts were made the fully ripe clusters were always cut on a

dry day, trimmed clean of defective berries, placed in shallow trays, boxes or baskets, and stored in a cold but frost-proof room where there was little movement of the air. Some people pack in clean dry sand, others in wheat, oats or other cereal, still others in buckwheat hulls, cork, hardwood sawdust, soft hay, dried lawn clippings, etc. Still others place the clusters on shelves in an airy room for a few days then wrap in soft paper, pack one or two, not more than three, layers deep in cardboard boxes and store in a cool, dry room.

Another Canadian method is as follows: Naturally long keeping varieties are chosen for storing. The berries must adhere well to the stems and not be subject to shrivelling. The longer they remain on the vines without being frosted the better. They are gathered in clear, dry weather, placed one layer deep in shallow trays or spread on tables in a room kept open in dry, clear weather but closed at night and in damp weather. In two weeks or perhaps less when the stems have shriveled enough to resist mold, the fruit is carefully cleaned of defective berries and laid on storage trays piled to any convenient height, the top one being covered. A crack of one-eighth inch between trays is necessary for ventilation. A dry, cold, but frost-proof room, will hold the best keepers until Midwinter or later. Among varieties that have been kept in good condition by this method until Thanksgiving Day are Lady Washington, Worden, Delaware and Concord; until New Year's Day, Duchess, Barry, Agawam, Massasoit; till Mid-January or later, Salem, Catawba, Vergennes, Wilder and Gaertner.

Pears should always be gathered when they will separate easily by gentle lifting, not pulling, from the tree, without breaking either the stem or the fruit spur. This may be a week to two weeks before they would become ripe on the tree. A dry, well-ventilated but not drafty, room or a clothes closet is excellent and will supply best conditions for final ripening. Where too many are secured for such quarters they may be placed on trays or wrapped in paper and packed in boxes and stored in a cool, dry room. Winter Pears may be stored like Winter Apples, except that a week or more before they are to be eaten as many as will be needed should be moved to warmer quarters for the final ripening mentioned above.

Quinces may be stored like Winter Apples successfully until Christmas; usually, however, they are used soon after gathering.

CHAPTER XI

The Various Species of Fruits

Apricot—Apple—Crab Apples—Barberry—Blackberry—Buffalo Berry—Cherry—Cranberry—Currant—Cydonia, or Japan Quince—Elderberry—Fig—Gooseberry—Goumi—Grape—Huckleberry and Blueberries—Japonica—Juneberry—Loganberry—Loquat or Biwa—Mulberry—Nectarine—Papaw—Peach—Pear—Persimmon—Plum Species and Varieties—Pomegranate—Quince—Raspberries—Sand Cherry—Strawberry—Viburnum—Wineberry—

APRICOT

THE Apricot is sadly neglected as a family orchard fruit. This is regrettable, first, because the early varieties begin to ripen fully six weeks before really good Peaches, and second, because Apricot flavors are different from those of every other fruit.

One reason why this tree is so little planted east of the Rocky Mountains is that people have formed their opinions of the fruit from the supplies shipped East from California. This is unfortunate because the varieties growing there for shipping are not of the best dessert quality and also because the fruits when gathered are immature. If these same commercial varieties could be eaten when fully ripe and fresh from the trees in California the Eastern prejudice

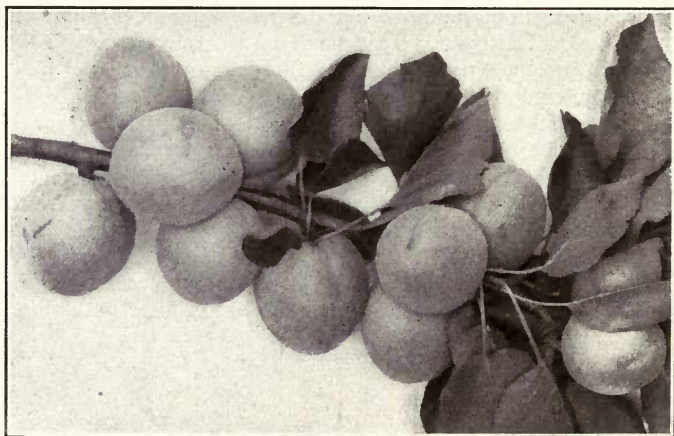


Fig. 81.—Apricots well grown set fruit like this every year

against the Apricot would largely disappear and if the choicer kinds could then be tasted the judgment would probably be in favor of planting at least a tree each of several varieties for family use.

A more direct but also erroneous reason why the Apricot is less planted in the East than it should be is the belief that the tree is not hardy. This belief is based on the experiences of people who have planted the trees where they should never have been set, namely, in warm positions—eastern, south-eastern and southern slopes, or near buildings or walls that face these directions. The result is the premature swelling of the blossoms with the almost inevitable result of injury by a cold snap during bloom or shortly after the fruit was set. The coldest and least exposed site—a northern or western slope should always be selected for the Apricot, because the opening of the buds will thus be retarded and the danger of frost damage much more frequently avoided. An eastern wall should always be avoided because if the buds are very cold or frost-bitten the early morning sun will prevent their recovering as they might on a western or a northern wall.

When planted on rich, deep, well-drained soils the tree is as hardy as the Peach and almost as reliable a cropper. To have the surface few inches of soil dry is not enough; the subsoil must be dry too. Apricots are almost sure to die when planted where the subsoil is wet. When there is no choice as to soils it is desirable to buy trees budded on Plum roots if the soil is at all heavy and hard to drain and on hard-shelled Almond or Peach roots when the soil is light and porous. In general the Plum stock is the more popular; while the Peach root seems to make a better union, the Plum produces a hardier, longer-lived tree and one almost immune to borer attack. Apricots on Peach roots must be "wormed" every Fall just as if they were Peaches.

Another, now needless, cause of failure is the curculio which is especially partial to the fruit. But this is easily controlled by thorough spraying and by confining chickens around the trees from the time the flowers open till the fruit has been gathered. As the foliage is sensitive the spray formula should be two pounds of arsenate of lead to each 50 gallons of self-boiled lime-sulphur, first when the calyces fall, second two or three weeks later.

Pruning is practically the same as with the Plum. The bloom buds are borne partly like the Peach—two with a leaf bud between—on last season's wood and partly on spurs. Unless severely thinned the fruits are likely to be small and inferior and the trees are almost sure to bear only in alternate years.

LEADING VARIETIES

- BREDA EARLY.** Small to medium. Orange with reddish cheek. Flesh orange, rich and high flavored. Freestone. Sweet kernel. Tree hardy and very prolific.
- EARLY GOLDEN.** Small, pale orange; flesh orange; fairly juicy, sweet and good flavored; kernel sweet. Freestone. A week or more earlier than Moorpark.
- HARRIS EARLY.** Medium, bright yellow, red cheek, juicy, good. Tree hardy and prolific.
- MOORPARK.** Old standard of Apricot excellence. Unrivalled in quality. Round, often over two inches in diameter. Orange with brownish red cheek, dotted. Flesh orange, firm, juicy, rich, luscious. Parts freely from the stone which is perforated along the back. Kernel bitter. Usually ripens unevenly. Tree rather tender, bears irregularly. Should be first choice for family orchard.
- PEACH.** Often two inches in diameter. Yellow, orange and brown mottled in sun. Ripens rapidly just before Moorpark. Flesh yellow, juicy, rich, high flavored. Stone resembles Moorpark. Kernel bitter.
- ROMAN EARLY.** Medium, pale yellow with few red dots; flesh fine grained, rather juicy, good flavored. Kernel bitter. Tree prolific.
- ROYAL.** Fairly large. Dull yellow with reddish cheek; flesh pale orange, firm, slightly subacid, juicy, high flavored. Freestone. A week earlier than Moorpark.
- ST. AMBROISE.** Large, early; yellow with reddish cheek. Flesh firm, juicy, sugary, rich.
- (Russian varieties are reputed hardier than the others mentioned. They are considered inferior in quality. Leaders offered by nurserymen are ALEXANDER, ALEXIS, and BUDD.)

LEADING CALIFORNIA APRICOTS.

- BLenheim OR SHIPLEY.** Rather large, orange, juicy, fairly rich. Good grower and prolific cropper. Follows Royal.
- HEMSKIRKE.** Follows Royal. Orange with red cheek. "More juicy and sprightly than Moorpark with rich, luscious plum-like flavor"—*Downing*. Kernel bitter. Hardier, earlier, more regular cropper than Moorpark.
- MOORPARK.** Described above.
- NEWCASTLE.** Freestone. Smaller, less rich, higher colored and three weeks earlier than Royal. Good regular cropper.
- PEACH.** Described above.
- ROYAL.** Described above.
- TILTON.** Regular, prolific bearer, large. Freestone. Ten days after Royal. Colors prematurely; hence may be picked too soon for best quality.

APPLE

No tree fruit is so universally popular, has developed so many varieties, is so extensively grown, is prepared for the table in so many ways or is so frequent a subject for poetry and song as the Apple.

Everyone enjoys it, its varieties run into the thousands and according to a pamphlet published by the Apple Advertisers of America (a now extinct organization) it may be prepared in 197 ways for the table, to say nothing of cider, vinegar, and other products not strictly culinary. To quote a few lines from *Fruitful Reflections*, by Florence Ferguson Branch:

“ . . . When Winter's comin' on
And Summer's flowers and heat are gone,
Ripe Apples growin' on a tree
Of your own plantin'—seems to me
There's nothin' in this world so fine.

* * * * *

“There is no nectar anywhere,
No ambrosia to compare
With Apple juice—and Apple pie
And Apple-jack—sh-sh-sh, Kansas is 'dry'—
I guess we'll stop at Apple pie.
That's good enough—just ap-ple-pie.”

The quality of an Apple variety, perhaps more than of any other fruit, must be judged by the use to be made of the fruit. For dessert the Apples should be of medium size, good color, regular form and the flesh fine grained, rich, aromatic and more or less “sprightly” or “vinous.” Except, perhaps, for certain culinary purposes, extra large and coarse-fleshed varieties are attractive only to boys and undis-

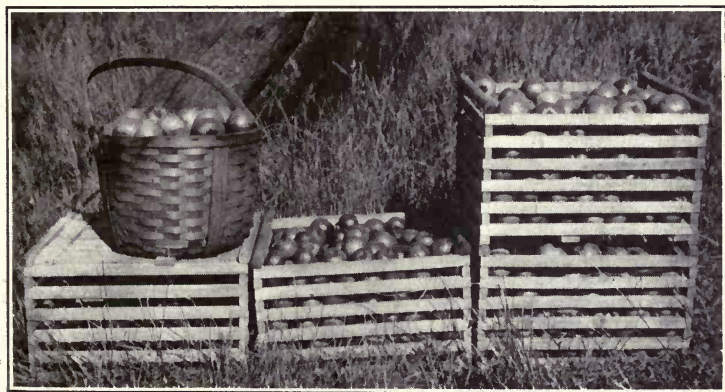


Fig. 82.—The swing bale basket and the collapsible crate are convenient receptacles for Apples. This style of basket should be lined with burlap because of the angles on the wood

criminating grown-ups. Best cooking Apples should be decidedly more acid and more pronounced in flavor than the dessert kinds, because heat dissipates part of the acid and the volatile oils upon which flavor depends. They should be capable of cooking evenly to a tender, not necessarily "mushy," consistency. For cider it is customary to use the cull fruit, but a product of finer quality may be made from fruit of the tart varieties rather than the sweet ones.

The Apple will thrive on practically all well-drained soils except very dry and sandy ones. It does best on strong and heavy loams. "A deep, strong, gravelly, marly, or clayey loam, or a strong sandy loam on a gravelly subsoil, produces the greatest crops and the highest flavored fruit, as well as the utmost longevity of the trees."

In the southern half of the United States the trees will generally do best when planted on western or northern slopes so as to reduce the effect of the Summer sun; in the northern half and in Canada other aspects may be preferred.

In planting Apple trees always remember that you are making an investment for at least two generations and that, therefore, the conditions for dividends in the form of crops must be made as favorable as possible. First, *place the trees far apart*. While varieties differ in their spread and in their height it is wiser and safer to exceed the maximum distance between trees than to approach the minimum; for trees so liberally treated will be far lower-headed and therefore more easy to prune, spray, etc., than closer set trees. The space between may be utilized while the trees are small, as already suggested. (Page 34).

APPLE VARIETIES TO COVER THE WHOLE SEASON

(Arranged in relative order of their beginning to ripen, from Midsummer to Midwinter, the season of each extending from two or three weeks, mostly with early kinds, to three or four months, mainly with the late ones).

MIDSUMMER

EARLY HARVEST. Pale yellow, medium sized, tart, tender fleshed, good dessert or cooking variety, highly valued by hornets, wasps—and boys! Fruit scabs badly unless sprayed well. Tree moderately good grower and fairly long lived. Almost an annual cropper.

PRIMATE. Medium sized, pale yellow or whitish, often pink cheeked. One of the earliest really good dessert kinds. Ripens during long season—sometimes eight weeks. Tree good grower, reliable biennial, sometimes annual, bearer; rather tender in some sections, but generally thrifty, fairly long lived and productive.

SWEET BOUGH. One of the choicest sweet Apples. The yellow, luscious fruits ripen unevenly during four to six weeks. Tree rather precocious, long lived, but in unfavorable locations sometimes injured by cold and canker.

YELLOW TRANSPARENT. Medium sized, yellow, excellent for cooking while immature, but too tart for eating until fully ripe. Tree remarkably precocious, fairly vigorous, hardy, healthy, but sometimes suffers from fire blight.

LATE SUMMER

BENONI. Beautiful little red, high quality, dessert variety. Tree a fairly precocious, biennial bearer.

EARLY JOE. Small to medium, red striped, dessert variety. Tree slow growing but rather precocious, fairly long lived; generally bears biennially. For an early variety the fruit hangs well on the tree.

EARLY STRAWBERRY. Very beautiful, small, deep red, dessert variety, useful also for cooking. Unless well managed often undersized and imperfect. Tree precocious, almost annual bearer, hardy, healthy.

RED ASTRACHAN. Beautiful red, medium sized, tart, culinary variety, specially fine for pies and jelly; when fully ripe and well grown good for dessert. Tree good grower, medium sized, long lived, precocious, almost an annual bearer of good to heavy crops. Fruit hangs well till ripe, but ripens unevenly.

WILLIAMS. Beautiful red, medium to large, rather dry fleshed. Needs thinning and several pickings. Tree only fairly sturdy, precocious and a reliable, almost annual cropper, when well handled.

EARLY FALL

CHENANGO (Sherwood's Favorite). Beautiful red striped, elongated. Unless well sprayed much subject to rotting on the tree. Trees bear young and annually. They are healthy, hardy and fairly long lived. Delicious dessert variety.

KESWICK (English Codlin). Medium to large, yellow, tart, cooking. Tree sturdy, vigorous, hardy, healthy, long lived, bears young; fair to very good; crops almost yearly.

OLDENBURG (Duchess). Handsome red striped, cooking. Ripens for several weeks. Tree wonderfully hardy, vigorous at first but rather slow growing when once in full bearing. Does well on clayey soils. Very precocious, reliable, biennial, often almost annual, cropper. Fruit hangs well on trees properly managed.

PORTER. Elongated, mostly yellow, rather tart dessert and culinary. Tree vigorous, hardy, compact, precocious, fairly regular biennial cropper.

ST. LAWRENCE. Large, handsome red striped, very juicy, dessert. Precedes Fameuse which it somewhat resembles. Tree hardy, fairly strong grower, generally healthy, fairly long lived, reliable biennial, good to heavy cropper.

SUMMER RAMBO. A prominent southern Pennsylvania general purpose fruit. Tree strong grower, bears young, moderately to liberally and almost annually.

MID-FALL

BLENHEIM. Large to very large, red striped yellow, dessert or cooking variety, mid-Fall to early Winter, sometimes later. Drops badly and unless well managed produces many culls.

COX ORANGE. One of the choicest English varieties. Fruit red and yellow, medium size. Tree fair grower. Excellent as a dwarf.

FALL PIPPIN. Large, yellow, tender-fleshed dessert and culinary variety. Mid-Fall to early Winter, but often difficult to keep late. Unless well sprayed likely to scab. Tree strong grower, hardy and very long lived; very large with age.

FAMEUSE (SNOW). One of the choicest dessert Apples. Excellent for jelly but poor for cooking. Very subject to scab. Tree medium size, fair grower, hardy, healthy, rather long lived, reliable biennial, almost annual cropper.

GRAVENSTEIN. Splendid red striped, dessert fruit, but unrivalled in its season, if at any time, for cooking. Tree not fully hardy or healthy in some sections; bears rather young and is a fairly reliable cropper. Fruit should be picked several times.

MAIDEN'S BLUSH. Lemon yellow variety with beautiful crimson cheek. Flesh white, acid, juicy, excellent for cooking. Tree good grower, hardy, fairly long lived, rather precocious and almost an annual bearer of good to full crops. Fruit drops badly on light soils.

MOTHER. Medium sized red, tender fleshed, aromatic dessert. Tree rather small, subject to trunk and root troubles; slow to begin bearing and only moderately productive biennially.

WEALTHY. Bright red, medium sized, general purpose. Trees precocious, famous for hardiness, but as they age they are prone to bear much undersized fruit, especially when overloaded. Two or more pickings advisable, because crop ripens unevenly.

LATE FALL

BLACK GILLIFLOWER. A very pointed, often dark reddish purple aromatic dessert fruit not acid enough for cooking. Apt to become mealy when fully ripe. Yields clean fruit regularly and well on good soil.

GRIMES (Golden). Rich color, excellent flavor, medium size. Poor keeper. Productive but usually biennially. A leading western Maryland variety. Tree subject to trunk and root troubles.

HUBBARDSTON. Excellent, but rather large for dessert. Bears young and very heavily but almost biennially. Trunk somewhat tender in severe Winters and susceptible to canker.

LOUISE. Somewhat resembles Fameuse and McIntosh in flavor and Maiden's Blush in skin, but is a late Fall to Midwinter sort. Tree hardy, healthy, fairly precocious and moderately productive annually.

MCINTOSH. Beautiful rich red, medium sized, delicious, tender fleshed dessert Apple similar to Fameuse, which it follows in season. Tree strong, hardy, healthy. A somewhat slow grower and sometimes not very productive, though usually fairly precocious and almost an annual cropper.

PECK (Pleasant). Yellow blushed dessert fruit of best quality. Tree often shy bearer, though sometimes prolific; somewhat subject to root and trunk troubles. Unless well sprayed fruit often undersized and ill-shapen.

POMME GRISE. A little russet of highest dessert quality. Specially fine in the St. Lawrence valley and other cold sections. Distinctly a home

fruit. Tree hardy, healthy, long lived and fairly prolific. Fruit hangs late.

SMOKEHOUSE. Prominent in southern Pennsylvania. Often poorly and unattractively colored. Excellent dessert variety but scarcely acid enough for cooking. Tree vigorous, healthy, hardy; alternating large and moderate crops; bears young. Needs interior branch trimming. Fruit hangs well. Subject to scab.

STAYMAN WINESAP. Delicious red Apple, but rather large for dessert. Largely planted in southern Pennsylvania, western Maryland and adjacent sections. Growers complain that the fruit "water cores" and the tree is not robust.

TOLMAN (Sweet). Medium sized, yellow, sweet fruit, popular for spicing and baking. Tree sturdy, long lived, fairly precocious, reliable but usually moderate biennial, or almost annual, cropper.

TOMPKINS KING. Beautiful large red and yellow streaked fruit of excellent quality for dessert and cooking, especially baking. Tree often a shy bearer, subject to trunk and root troubles, short lived. Fruit drops badly; is especially subject to coddling moth ("worms") and "water core."

WAGENER. At its best a fruit of surpassing excellence and beauty for dessert—rich flavor, fine grain and beautiful blush red. Tree vigorous and upright at first but later becoming weak and too branchy. Precocious bearer and while healthy a reliable almost annual cropper, often overbears.

EARLY WINTER

BALDWIN. Bright red medium-sized fruit of fair quality when well grown. Keeps till Spring. Leading commercial culinary variety from Massachusetts to Michigan. Tree slow to reach maturity and apt to bear sparingly in alternate years. Fruit subject to a physiological defect, unsightly brown flecks in the flesh.

ESOPUS (Spitzenburg). Standard of excellence among early Winter Apples, both for dessert and cooking. Variable in keeping quality in different sections and seasons. Very susceptible to scab and canker. Fairly regular but often light yielder.

EWALT. Clear yellow blushed, large fruit, too acid for dessert but excellent for cooking, especially baking. Tree rather shy bearer. Popular in southwestern Pennsylvania.

JONATHAN. Beautiful brilliant red, highly flavored dessert fruit but variable in size. On fertile soil trees bear young and abundantly, but usually biennially.

NORTHERN SPY. When well grown, one of the best Winter Apples. Large, bright red, crisp, juicy, tender. Excellent culinary and dessert variety through Winter. Trees erect, large, slow to bear but long lived; reliable biennial, sometimes almost annual, cropper. Very leafy trees yield many poor, often inedible specimens.

RAMBO. Prominent general purpose southern Pennsylvania variety. Excellent when well grown but variable in size and quality, especially on old trees and on heavy soils. Because the wood is brittle breakage is common unless the fruit is thinned.

RHODE ISLAND (Greening). Prominent culinary and fair dessert variety from Massachusetts to Michigan. Tree rather slow to start bearing,

but long lived, large, very spreading; needs extra space; when well handled almost an annual cropper. Needs interior thinning of branches to admit light.

SUTTON. Beautiful red, fine flavored dessert fruit. Follows Hubbardston. Trees vigorous, usually biennial croppers. Reported remarkably healthy in some sections but susceptible to fungous diseases in others.

SWAAR. Specially delicious home variety. Trees often attacked by root and trunk troubles. In some sections shy biennial bearer; in others heavy croppers annually. They require deep, rich sandy loam to produce best. Damp and cold soils are unsuitable.

SWAZIE. Equal if not superior to Pomme Grise, from which it differs in being more elongated and yellower. Trees not very vigorous.

WINTER BANANA. Large, yellow blushed, aromatic dessert. Too mild for cookery. Tree fair grower, bears young and almost annually; crops usually fair to large. Resembles Maiden's Blush but larger.

YELLOW BELLFLOWER. Large when well grown; often small otherwise. Tart but popular for dessert. Excellent for cooking. Scabs and bruises badly, hence the need of thorough spraying and careful handling. Tree sturdy, fairly hardy, healthy and long lived, but only moderate cropper. Thrives best on warm, well-drained soils.

MIDWINTER

GOLDEN RUSSET. Famous for long keeping—till mid or late Spring. Medium size. Fruit hangs well on trees till loosened by frost. Hard to pick because borne largely on branch tips. Excellent for dessert and cooking. Nearly an annual cropper.

NEWTOWN (Albermarle Pippin). Two forms, *Yellow* and *Green*. Superlative quality. Trees bear young but usually biennially. Fruit hangs well on tree. Susceptible to scab, especially on clay soils. Unless well cultivated and sprayed, likely to be wormy and small.

ROXBURY (Russet). Very popular Russet in Northern and cold sections. Varies greatly in size and appearance in different sections. Wonderful keeper—till late Spring or early Summer. On rich soil the tree bears full crops biennially; on poor ones it is unsatisfactory.

STARK. A very productive, hardy, healthy, thrifty, reliable bearer of smooth red though often poorly colored fruit that keeps well till late Spring. Though not of highest quality, superior to Baldwin, which it surpasses as a keeper. Succeeds well where Baldwin thrives.

WINESAP. One of the most popular American Apples, especially in the Alleghanys from Pennsylvania southward to North Carolina. Usually small, dark red, very firm and fine grained. Midwinter to early Summer. Tree vigorous but not rank, bears young and practically every year. Succeeds best on deep, light, rich soils, not on heavy or damp ones.

CRAB APPLES

EXCELSIOR. Large for a Crab, beautiful red; excellent for dessert or cooking. Season early Fall. Tree sturdy, healthy, precocious biennial, heavy cropper.

FLORENCE. Medium sized, pink and yellow fruit of good quality. More prolific and attractive, but not superior in quality to Martha. Trees bear young and abundantly, usually in alternate years.

HYSLOP. Large, brilliant dark red with purple bloom, clustered. Tree hardy, good grower, reliable biennial, almost annual, cropper. One of the best-known and widely grown Crabs.

MARTHA. Large, handsome yellow and red, excellent quality. Tree fairly sturdy, very hardy, precocious, almost a regular annual, good to heavy cropper. Fruit hangs well to the twigs.

TRANSCENDENT. Rather large, red and yellow streaked; excellent culinary variety. Precedes Hyslop. Tree good grower—spreading, hardy, very productive, almost annually.

WHITNEY. Large yellow and red late Summer Crab; very popular in the Northwest. Good for dessert and excellent for cooking. Tree vigorous, precocious, very productive.

BARBERRY

Among the many species of Barberries grown for ornament the “common,” not the Japanese, one is of interest for its scarlet fruits which ripen in late Autumn and hang on the bushes until Spring unless eaten before that time by birds. These berries, while too acid to eat raw, make an ornamental pickle useful for garnishing, an acceptable though rather seedy preserve and an excellent jelly of peculiarly brilliant color and distinct tart flavor. The plant will grow in any well-drained soil and with no attention except the occasional removal of failing stems in the interior of the bushes.

BLACKBERRY

The Blackberry is nature's barbed-wire entanglement. Of all the untamable, obstinate, “sot-in-its-way,” fruit plants it is generalissimo. With rare and trivial aberrations of purpose it has refused to part with its needle-like spines and it similarly refuses to spare any mortal who attempts undue familiarity with it. The only two safe ways to handle it are to wear mediæval armor and to keep a safe distance away from it! For it seems to take delight in finding vulnerable spots and stabbing, grabbing and tearing human flesh when least expected.

Then why give such an unappreciative, distrustful, vindictive plant a place in the home garden among docile, self-respecting fruit and vegetable society? Let the following conversation supply the answer.

One of my city friends who has recently moved to the suburbs was asking me about the kinds of fruits to plant in his garden. When I came to Blackberry he said neither he nor his family liked them. Then he remarked that very few people of his acquaintance enjoy them and asked why I recommended them.

“City bred people,” I replied, “have never eaten any but the unripe, day old or older, fruit they get at the groceries. In order

to reach the market at all this fruit must be picked while still firm, which means unripe, for if picked when fully mature it would be a mass of juiceless mush after the ordinary trip to town by express or fast freight. At least a day, often two or three, must elapse before the fruit is finally served. Unripe Blackberries do not ripen in transit; they deteriorate from the moment they are picked. Then if they are of a poor variety to start with, as most market varieties are, is it any wonder 'so few people like Blackberries'? But if you will grow only the choicest varieties and if you will gather only those juicy, fully ripe fruits that drop off the bushes with scarcely more than a touch and if you will immediately serve them you will forget the prickly embraces of the bushes and be willing to concede that there certainly are compensations.

"Every home," I continued, "should have its Blackberry patch to appease the family appetite—no easy task if the berries are gathered in the pink—or rather the black—of perfection. Why, man, when the gods invented the terms 'nectar' and 'ambrosia' it was while the delectable flavor of fully ripe Blackberries and powdered sugar (I'm not sure about the sugar!) lingered on their palates. You simply must have enough plants, a score, or at least a dozen, to live like the gods as long as the season lasts."

"But," he said, "I've heard that Blackberries will take possession of the place. Is that true?"

"Yes, if they're neglected. But so will many other plants. If you will pull up, while they are small, the suckers that appear where they are not wanted instead of waiting until they have become woody and then cutting them you'll have no difficulty in confining the plants to the area and you will also prevent having the ground full of Blackberry cane stumps from which new canes are sure to develop."

Blackberries of various kinds will succeed well in almost all soil and temperate climate conditions, except the coldest, where, however, by Winter protection even the only semi-hardy ones may be grown successfully. Wherever the Peach will stand the Winter, Blackberries will also. In hot, dry regions, unless irrigated, both the plants and the fruits are inferior. The best soils for this plant are cool, deep, mellow loams well supplied with decaying vegetable matter. Sandy and gravelly soils are generally too warm but may be cooled and kept more moist by mulching with straw, corn-stalks, leaves or other loose material. Wet soils are decidedly unfavorable. Drainage, however, may make them suitable. If the soil is naturally rich it will not be necessary to fertilize very much. Manure must be used with caution as it tends to make long, sappy growths which are often killed by Winter and are less productive than sturdier, more stocky ones.

Where mulches are not used the essential vegetable matter may be supplied by cover crops, the legumes used with caution to prevent getting so much nitrogenous matter that the growths might become rank.

Blackberry and Red Raspberry plants naturally propagate from suckers which may develop whenever a root becomes injured in any way for instance, by tillage. The losses among plants so produced, often in amateur hands, reach a high per cent., in spite of apparently good care in planting. It is claimed by many nurserymen and practical



Fig. 83.—Blackberry before Spring-pruning

growers that plants produced from root cuttings, though 10 to 25 per cent. more costly, are far more successful than sucker plants. Still more expensive—perhaps 50 per cent. more, on the average—but also more satisfactory in amateur hands, are the plants produced from transplanted root-cutting plants—two seasons old when sold—because they are surer to grow and may be expected to produce some fruit the first season.

When plants are set closer than four by seven feet they are likely to become too crowded when three or four years old. Five by eight or nine feet is better. As this may be extravagant of space in the home garden the plan of placing the plants three or four feet from the fence is a good one provided the suckers are kept pulled on all sides.

The plants may be set six or seven inches deep with a spade. During the first year vegetables may be grown in and near the Blackberry rows. The second year none but early maturing vegetables such as Lettuce, Radishes, Onion Sets and Spinach should be grown so the Blackberries will not be robbed of plant food and moisture.

Every year as each desired cane reaches a height of 18 to 24 inches its tip should be pinched to make it grow short, stocky and low-branched and to avoid the expense of trellising. While commercial growers often have five or six fruiting canes to a plant, two to four are better for home use because the fruit will be larger and of higher quality. Since the earliest canes to develop are usually the best the

later ones should be pulled as they appear, thus throwing all the food and energy into the chosen ones.

Blackberries, like Raspberries and Dewberries, have a perennial "crown" from which the best "canes" are developed. These canes become branchy and woody by Fall (Fig. 83). A few varieties occasionally produce some berries on these young canes late in the season. I have had Kittatinny berries from such canes in October—two months after the older canes had finished bearing. The main crop is not borne until the following season.

In the Spring of each year the branches on the canes are shortened, (Fig. 84), the amount depending on the fruit-bearing habit of the variety. The branches of varieties that bear their fruit close to the main cane may be shortened in rare cases to only eight or even six inches. But to cut as closely as this, other varieties which bear far from the main cane would be to destroy the fruiting parts. Until the habit of the variety is learned the safest way is to leave the branches 15 or 18 inches long at first and make a second shortening a joint or two beyond the outermost flower clusters when these appear. No fruit can usually be counted upon the season the sucker and root cutting plants are set and only a small amount the following year. The third year is the first when liberal fruitage should begin. Trans-

planted plants bear the first year. With proper care a plantation should continue productive for about ten years, but when the canes begin to be spindly and the fruit small a new plantation should be started

After the crop has been gathered every old cane should be cut close to the ground, because from that time forward it is a menace to the well-being of the younger canes since it is prone to become infested by disease and insects. Besides, it will die anyway during the Winter. So the sooner it is removed the better.

Tender varieties must be protected during Winter or the canes may be killed back to the ground. Hardy ones may suffer more or less in their imperfectly ripened



Fig. 84.—Blackberry after Spring-pruning

branches and canes. Hence another reason for preventing the development of any but the earliest canes. The popular method of protection is practised as follows:

Late in the Fall, but before the ground freezes, earth is removed from two sides of the first hill or crown. Then the canes in this hill are bent over with a manure fork across one of the excavations, towards the starting end of the row. They are next covered with soil taken mainly from beside the second plant, which in turn is bent down so its canes perhaps overlap the first hill and so on till the whole hill is covered. Sometimes straw is used instead of earth, but it demands more work and is no better. Canes that break or split rarely survive the Winter. In Spring when the buds begin to swell, the earth must be removed, the canes straightened and the earth replaced around the crowns.

Most commercial plantations are tilled very shallow and kept clean until the berries begin to turn black. After harvest one shallow cultivation is given and a cover crop sown. Because the Blackberry produces roots near the surface the tillage must always be shallow to avoid injuring the plants and inducing the formation of suckers. Heavy mulching after the first or second Summer of clean tillage is recommended by some growers who claim that they get larger and superior flavored fruit thereby. For home gardens the latter plan seems to be specially adapted.

BLACKBERRY AND DEWBERRY VARIETIES

AUSTIN IMPROVED. A hardy, vigorous, healthy Dewberry which ripens its large high quality berries fully a week earlier than Lucretia. Earliest of all.

BLOWERS. An erect variety noted for hardiness, great prolificacy, large, luscious, fine-flavored fruit and long season of bearing—often July, to October.

ELDORADO. A hardy mid and short season, medium-sized, productive, sweet variety of good flavor.

ERIE. An early, vigorous, hardy, large-berried, productive variety of only moderate quality.

ICEBERG. Notable because of its so-called "white" fruits which are said to be large and sweet. The plant while very productive is not fully hardy. Mine all died the first Winter they had a chance. They were not protected.

JOY. A new mid-season variety more highly praised by the introducer than usual. Plant said to be stocky, vigorous, healthy, highly prolific, exceedingly hardy; fruit large, jet black, rich, luscious. One of my friends addicted to fruit-testing but not to exclamation points and superlatives declares it to be the best variety growing on his place. Mr. Leonard Barron, editor of the "Garden Magazine," told me, "It knocks everything we've ever grown on our dry soil at Garden City,"

KITTATINNY. This late, large-fruited, prolific but somewhat tender variety has stood at the quality head of the variety list for over 50 years. In a

recent home test of six varieties—Snyder, Erie, Taylor, Eldorado and Blowers—fifteen out of sixteen people who sampled the freshly gathered fruits without knowing the identification of any one chose Kittatinny as the most delicious.

LUCRETIA. For more than 20 years the leading Dewberry because of its hardiness, prolificacy and large, very early, moderately high quality berries. Being a trailer this variety must be staked or trellised.

MERCEREAU. A medium-sized fruit of excellent quality borne liberally on vigorous, hardy canes.

RATHBUN. A hardy, erect growing but rather dwarf plant which produces very few suckers, but, like the black Raspberry, roots at the tips of the young canes. Fruit very large, juicy, sweet and high flavored.

SNYDER. Too small and of too poor quality for the home garden.

TAYLOR. An old, very hardy, late, productive variety which bears medium-sized, fine-flavored fruit.

WACHUSETT THORNLESS (often listed under each of these names used separately), being practically spineless and remarkably hardy is fairly popular with amateurs, but unless carefully managed it is not very prolific and the berries, though of good flavor, are inclined to be small.

WARD. A remarkably sturdy, prolific and hardy descendant of the Kittatinny, with large, melting, high quality, handsome berries.

WILSON. A strong growing but rather tender highly prolific variety which bears very early, very luscious sweet berries.

BUFFALO BERRY

In the Northern Prairie States, adjacent Canada and southward to New Mexico, grows a handsome six- to twenty-foot wild shrub with silvery foliage and red or yellow berries. Within the past ten or fifteen years Western nurserymen have been offering plants for home plantations of this shrub.

As the species is dioecious—that is, has “male” and “female” flowers on separate plants—it is important to plant some of each in order to get fruit. The male plant never bears fruit and the female must have the male near by so pollen will fertilize the flowers. A satisfactory proportion is one male to four or five female plants.

The wild fruits differ considerably in size, season and quality; the cultivated varieties have been selected or bred from the best wild plants. Some varieties are sprightly and good enough to eat raw. Generally they are considered better after being frosted. Another advantage of frosting is that less sugar is needed for making the delicious jelly for which they are noted. Unfortunately the plant is so thorny that gathering the fruit is more unpleasant than gathering Gooseberries. But in sections of the country where fruits are hard to grow because of the cold the Buffalo Berry deserves a place. Prof. N. E. Hansen has conducted experiments with this fruit. His writings upon it have been published by the South Dakota Experiment Station.

Wild plants do not transplant very well. Therefore it is best to get nursery grown ones. Seedlings are easy to grow from seed washed free from the ripe pulp and stored underground in the garden till Spring. But since one must wait till these produce blossom buds to recognize the sex it is better to rely upon the nurseries for plants. During the Winter male plants may be recognized by their dense clusters of rounded blossom buds; and female by their fewer, smaller, flatter and more slender ones. The plants need no special kind of soil or method of cultivation.

CHERRY

With the exception of a few little-grown varieties of American origin, cultivated Cherries (Fig. 85) have originated from Old World



Fig. 85.—“She can make a Cherry pie” with fruit like this!

species. They range in acidity from Morellos, which have very tart, reddish juice, and Amarells, which have less tart, colorless juice, both originating from one species, to the sweet, soft-fleshed hearts and the firm-fleshed Bigarreaus originating from the other. Besides these there are the Dukes which being hybrids of sweet and sour partake of the nature of each, their fruit blending the tartness of the sour with the sweetness of the sweet in sub-acid fruits. The sour varieties are

mostly too tart to eat raw until very ripe. The sweets are often considerably thinned out, before fully matured, by birds and boys.

Of the two main groups the sour is by far the more cosmopolitan. It is grown from Newfoundland to British Columbia and in almost, if not all, of the United States and it thrives in a wider range of climates—cold, hot, dry—and soils than perhaps any other tree-fruit. The sweet varieties are more fastidious as to temperature, humidity and soils, are less hardy, more subject to insect and fungous attack. But regret on these accounts would not prevent my planting them in my home orchard unless I knew them to be a failure in the neighborhood. Even then I'd be tempted to risk planting a few. Sweet Cherries are the earliest of our Northern tree fruits; they begin to bear while young, produce fruit each year, and because freshly picked, ripe, home-grown Cherries are wonderfully superior to those picked even the day before, they should be in every home plantation.

Among the hundreds of varieties cultivated to some extent in America are many which in some one respect may be better than the sixteen listed on following pages, but for one or more reasons they are less desirable or more difficult to grow to perfection, or they are not usually carried by nurserymen. While the ones discussed are among the most adaptable and otherwise desirable, they (especially the sweet ones) may be disappointing in the South and in the Prairie States, for there Cherries often do much more poorly than in other parts of the country. In these less favored sections, therefore, the sour varieties should be chosen first as the more reliable and the sweet ones tried with caution.

In buying Cherry trees preference should always be given to those propagated on Mazzard roots. These cost more than do those on Mahaleb roots, but they are worth all the difference because they make better, longer-lived trees. Nurserymen offer them less often than the others because they have more difficulty in growing them and unthinking or unknowing fruit growers call for cheap trees. In planting a big business orchard a large difference in first cost is, of course, an important item, but for the home orchard it will be a small one more than offset by the greater likelihood of success in making the trees live and develop into large, healthy, long-lived and prolific trees. So when looking over nursery catalogues be sure to order from the one in which prices are quoted on Mazzard-grown varieties.

Sour Cherries do best on moderately heavy loams; sweet ones on lighter, especially gravelly, shaly, sandy or stony ones. Usual distances for the former are 15 to 20 feet; for the latter 25 to 30. The trees are generally headed at 12 to 18 inches and allowed to develop

five to seven frame branches (Fig. 86) instead of a central stem. Thus they develop a goblet-like form. Removal of broken and interfering branches and shortening rampant, whip-like growths is about all the pruning required. Soil management is the same as that generally followed with other orchard fruits.

HOME ORCHARD CHERRIES

SOUR VARIETIES

AMARELLES AND MORELLOS

DYEHOUSE. A week earlier and less productive than Early Richmond, but of as good flavor and not so adaptable to soils and climates. Small, dark red, juicy, tart, of very good quality.

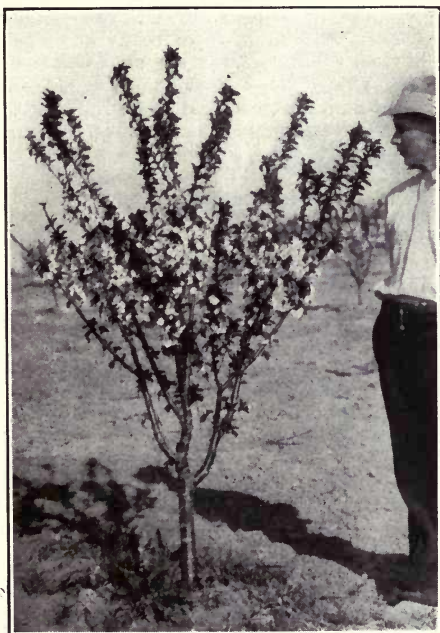


Fig. 86.—Four-year-old Late Duke Cherry

EARLY RICHMOND. Most cosmopolitan of all Cherries. Leading early sour. Fruit medium in size and quality, too acid for most palates till very ripe. Culinary. Tree remarkably adaptable to varied soils from Quebec to Carolina and westward to the Pacific States.

ENGLISH MORELLO. Standard late culinary variety. Follows Montmorency. Handsome, dark red. Resists brown rot and hangs long on the trees, which are small, round-headed and drooping. Hardy but sometimes unhealthy.

MONTMORENCY. Most popular sour Cherry. Mid-season, medium size, light to fairly dark red, tart, very good quality. Tree very vigorous, healthy and annually prolific; adapts itself to wide variety of soils.

SUB-ACID VARIETIES

DUKES

ABESSE D'OIGNIES. One of the best Dukes. Large, handsome, dark red, excellent quality. Late. Tree remarkably vigorous, hardy and productive. One of the few varieties that do well in the Middle West.

LATE DUKE. Two weeks to a month later than May Duke, which it somewhat resembles otherwise. Large, dark red, juicy, rich, sub-acid, excellent. Hedrick writes: "Cherries of New York": "If those who

want late Cherries will plant this variety on a northern slope, against a northern wall or where in any way shaded or in a cool soil, these delicious Cherries can be had until well towards August."

MAY DUKE. One of the most popular of all. Very early, dark red, medium size, sub-acid when fully ripe. Hangs three to six weeks on the tree after becoming edible. Tree adapted to wide range of soils; hardy, healthy, prolific.

ROYAL DUKE. Mid-season, between May Duke and Late Duke, which it resembles in quality.

SWEET VARIETIES

HEARTS

BLACK TARTARIAN. Leading black east of the Mississippi River. Tree adapted to great variety of soils and climates, prolific, healthy, long lived. Fruit medium-sized, attractive to eye and palate. One of the best in quality. Second early.

ELTON. A dark red and amber yellow, rather pointed, rich, luscious, early fruit. Very susceptible to brown rot. Tree sturdy, very productive, somewhat tender to cold.

WOOD. Soft-fleshed, amber, medium-sized fruit of excellent quality, among the earliest of the Hearts. Tree vigorous and healthy, somewhat tender to cold, only fairly productive, a little exacting as to soils. Hedrick says: "Cherries of New York": "It would be hard to name another Cherry better suited to small plantations and it is hoped that it will long be kept in the gardens of connoisseurs of good fruit."

BIGARREAUS

BING. Widely grown on the Pacific Coast. Very large, almost black, of excellent quality. Mid-season. Tree vigorous, rather open, productive.

LAMBERT. Equal or superior to its parents Napoleon, and Black Heart, in size and flavor. Tree sturdy, healthy, very prolific. Mid-season.

NAPOLEON. Leading Bigarreau. Large, handsome, amber, high quality, mid-season. Tree precocious, wonderfully prolific. One of the best.

SCHMIDT. Very meaty, mild and sweet. Delicious. Resistant to brown rot. Tree vigorous, healthy, prolific. Mid-season.

YELLOW SPANISH. A large mid-season, amber, reddish, meaty, sweet variety of excellent quality. Trees very large, vigorous, precocious, annually prolific.

CRANBERRY

The Cranberry is so distinctly different from other fruits in its soil requirements and its method of management; it is so easily and cheaply procured in the markets and is so distinctly a commercial specialist's fruit that it need not be considered as a home fruit. Those who wish to grow the Cranberry may perhaps save considerable work and money if they will first read the article on this fruit in the *Standard Cyclopaedia of Horticulture* or one of the authoritative books, *Cape Cod Cranberries* by Webb, *Cranberry Culture* by White, or publications

by the New Jersey, Wisconsin and Massachusetts Agricultural Experiment Stations and the National Department of Agriculture.

CURRENT

People who have been accustomed to the discovery of a few scrawny clusters of diminutive Currants on the naked stems of bushes stuck in a fence row, or in some out-of-the-way corner of the garden, will doubtless be surprised to learn that by proper care and feeding, individual bushes of Red Dutch Currant have yielded more than 12 pounds (nearly 10 quarts) and that bushes of Kerry Black Currant have borne over 10 pounds (about 8 quarts). The bushes which thus distinguished themselves were at the Central Experimental Farm in Ottawa, Canada, where only half a dozen of each were under test—just the conditions that should prevail in the home garden (Fig. 88).

Such possibilities, coupled with the wonderful, annual bearing habit of the plants, makes it easy to be seen that half a dozen bushes of Red or White Currants, or three of each, should give an ample supply for a family. Every garden should have space for that many bushes. Whether or not the black varieties should be included will depend upon the taste of the household, since the people who enjoy Black Currants are by no means as numerous as those who like red and white ones.

Currant flavor is fairly uniform for red and white varieties; among the blacks there is considerable variation. In each group other distinctions between varieties are earliness and lateness of ripening, lengths of the clusters and of the fruit stems—some being short, others long; the size of the berries—some being large, others small, and in many cases diminishing in size from large ones at the bases to small ones at the tips of the clusters; and the growth habits of the bushes—some being fairly erect, others prone to droop more or less.

Among the black varieties are **BLACK CHAMPION**, whose vigorous bushes bear medium-sized, mild fruits in fair abundance; **BLACK NAPLES**, similarly vigorous, but bearing variable-



Fig. 87.—Currant blossoms

sized, acid, strong-flavored fruits; **BLACK VICTORIA**, as vigorous as these two but rather more productive of large-sized, "fine-flavored" fruit; **LEE**, a dwarf, fairly vigorous bush which bears small to very large, acid fruits in moderate quantity; **PRINCE OF WALES**, a vigorous, very productive bush whose mild-flavored fruit, almost sweet when fully mature, varies from small to very large; **BOSKOOP**, a strong-growing, prolific variety, with rich, sweet fruit which ripens evenly and hangs long on the bushes.

Leading red varieties are: **WILDER**, an upright, vigorous, sub-acid, early variety whose large-berried, large clusters hang long after ripening; **POMONA**, noted for high quality, "sweet," large clusters of large berries which ripen early but hang long on the vigorous bushes; **DIPLOMA**, a very vigorous, highly prolific bush which in mid-season bears the "largest" berries which hang for weeks; **RED CROSS**, a strong-growing long, large-clustered, prolific variety with medium to large berries, ranked "good to best"; **PERFECTION**, awarded at least three gold medals for its large, long clusters of mild, sub-acid, large, pulpy, few-seeded berries, borne profusely on vigorous bushes; **FAY**, a rather sprawling but vigorous bush which bears a profusion of large, uniform, sub-acid, fine-flavored berries on large clusters with long stems; **CHERRY**, robust, stocky bush which bears short-stemmed clusters of very large, thin-skinned, sharply acid berries; **VERSAILLES**, much like Cherry but bears larger clusters; **RED DUTCH**, tall, upright bushes which yield an abundance of large, long clusters of medium-sized, sub-acid berries; **NORTH STAR**, an improved Red Dutch, excellent for jelly; **PRINCE ALBERT**, upright, stocky bushes bear abundance of rather short clusters of medium to large, splendid quality berries late in the season (as the stock is hard to propagate other varieties are unfortunately substituted for this by some nurserymen); **VICTORIA (RABY CASTLE)**, noted for its vigorous, upright bushes, prolificacy and long clusters of medium-sized, mild-flavored berries, said to be the best late variety; **LONG BUNCHED HOLLAND**, vigorous bushes bear long clusters of medium-sized berries of excellent quality, very late; **LONDON RED**, very prolific, vigorous, upright bushes, bear abundance of short clusters of rather acid, medium to large, berries.

Though only of moderate quality, **WHITE GRAPE** is the most planted white Currant. The vigorous, but low spreading, prolific bushes bear large clusters of large, mild berries. Three other white varieties are considered probably of better quality: **WHITE DUTCH**, an upright, vigorous, highly productive bush with long clusters of medium-sized berries of excellent quality, early; **WHITE TRANSPARENT**, the large, high-quality berries are milder even than White Grape or White Dutch; **WHITE IMPERIAL**, bush vigorous, prolific,

clusters large, berries very large, sweet, excellent for dessert, by some growers considered best of the white varieties.

The Currant does best in cool, well-drained moist soils—strong clay loams, even stiff clays. Sandy loams, if moist and not too light, also yield fairly well, but very light ones give poor results, unless kept moist by some means. They dry out too much and the Currant roots, which are mostly near the surface, suffer. Often a northern

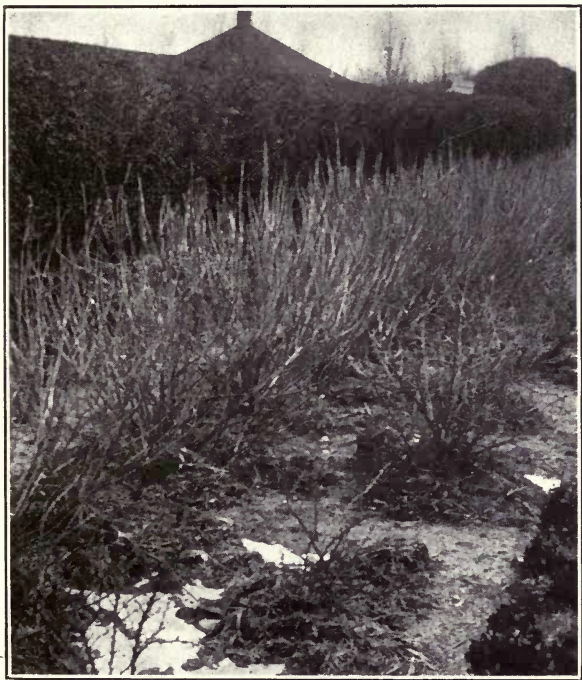


Fig. 88.—Currants and Gooseberries do well on the north side of a hedge

slope, partial shade near buildings and trees will help to offset lightness and porosity of soil. Mulching with manure and soil also will help. These aids will be found of most service as the Southern boundary of Currant growing is approached; for this plant, being of Northern origin, fails in the warm Southern States unless so handled.

Richness of soil is a necessity because the plants are gross feeders. As the roots do not extend far and are largely near the surface the food must be placed near-by. Stable manure applied as a mulch

after the first or second years will serve both as a mulch and as a source of part of the needed food. The best time to apply it is in early Spring. This should be supplemented by annual dressings of some form of phosphate and potash. Ground phosphate rock, acid phosphate and basic slag are all good forms of the former and muriate or sulphate of potash, of the latter. Unleached wood ashes are also an excellent source of potash. No fear of applying a dangerous amount! A well-spread, liberal handful of each, to each full grown bush will be ample.

One-year or two-year plants are better to plant than older ones. They may be set in well-prepared soil four by six feet apart, or five feet apart each way so as to favor cultivation in both directions. The sprawling and tall varieties had better be given larger space than the dwarfs and erect ones. Except to keep the surface soil loose and free from weeds, the plants will need no cultivation for the first year or two, after which the mulch may replace tillage. Care must be exercised to prevent perennial weeds such as quack grass from growing among the bushes (Fig. 91), or the quantity and quality of fruit will be reduced.

After the canes of red and white varieties have borne three or four years they had better be cut out as soon as the fruit has ripened, because they become weakened, subject to insect and disease attack and the fruit they bear is smaller both in size and amount. A favorite way to manage is to allow only the two or three best shoots that spring from the bases of the bushes to remain, the inferior ones being destroyed in early Spring. Thus the bush will consist of only six to twelve, preferably not more than eight shoots, after pruning in the Spring.

Black Currants bear best on still younger wood and fail more conspicuously on wood older than two years, so the canes may be cut out after fruiting the second time. Indeed, a writer in the *Garden* recommends cutting off the branches while full of ripe fruit, first as a convenient method of harvesting and second a satisfactory way to secure well-ripened wood and superior fruit the following season.

Half-grown Currants while still green make excellent tarts and pies; for jelly they give best results when colored, not fully ripe, but for dessert they are best if allowed to become "dead" ripe. If the fruit must stand long after picking before being used it should be picked while dry. In such cases the skins of the berries should never be broken, because if broken the fruit spoils very quickly and injures the perfect berries. Varieties with long stems are far easier to pick than those with short ones.

The Currant season may easily be extended until early Fall by covering the bushes of the late varieties with tarleton or cheese cloth.

Currants have special value not only for jelly and pies when used alone, but for "shrub," a cooling drink made by crushing the

ripe fruits and mixing with sugar and water. They also make a good wine. Bar-le-duc and other jams are made usually from the red varieties; jam and jelly also from the black, which are said to lose their strong flavor if scalded for a minute or two and drained before being put on to cook. An old-fashioned remedy for a cold was to make a hot drink by putting a couple of spoonfuls of Black Currant jam into a glass and pouring hot water on it, just before retiring. Red and white varieties have special value for blending with fruits which lack in acidity. They are very often added to Raspberries to make jam and jelly; similarly they improve the richness of the Juneberry. Nay, even the cloying and mawkish Russian Mulberry may be made into more than passable preserves by its acid.

As a dessert fruit its value is underestimated in America, probably because it is not allowed to ripen properly before being used. When fully ripe, stripped from the stems by drawing the clusters through a table fork, crushed and liberally dusted with powdered sugar, over night or several hours before being eaten, it is delicious for breakfast or supper—the very thing for the dog days, its period of ripeness. For this and the preceding reasons the Currant is one of the most deserving of bush fruits for the home plantation.

CYDONIA, OR JAPAN QUINCE—See Japonica, page 152.

ELDERBERRY

Until very recently no cultivated and named varieties of the Elder have been disseminated by nurserymen. Maybe this is because the fence rows and the waste places have supplied such an abundance of fruit there has been no apparent need to cultivate this native shrub. A few years ago, however, an Elderberry enthusiast introduced a variety which bears clusters of berries which, if my memory serves me faithfully, are “often half an inch in diameter and in clusters of a pint or more.” If this variety is what its introducer claims, it should be more valuable as an addition to the fruit garden than most of the wild plants now occasionally transplanted from the fence rows.

Elderberry bushes once planted in any soil or situation will take care of themselves except for the occasional removal of old and failing stems and a little police duty to see that they do not go beyond bounds. In this respect, however, they are not nearly such determined offenders as Blackberries and Red Raspberries. Moreover, they have no prickles and they are beautiful in June when loaded with their great bouquets of fragrant creamy bloom.

Among the country people, while eaten out of hand more or less, the Elderberry is famous for pies, tarts, canning, juice, syrup, wine,

preserves and jelly. Though of a peculiar, and to some people strong, flavor, the fruit and its prepared products are highly nutritive and generally greatly relished after a few trials. In my estimation they are far pleasanter than Black Currants, which they faintly suggest. As the berries are deficient in pectins they are better adapted to making thick syrups than jellies, but this lack may be supplied and better jellies made by cooking Crab Apples, immature Grapes or tart Apples with them.

FIG

While the Fig may be made to grow out-of-doors as far North as Southern Michigan and the lower Hudson Valley, the amount of

fussing and coddling is too great and the quality of the fruit too poor to warrant the trouble. As a home orchard fruit it is popular from North Carolina (Fig. 89) southward along the coast to Florida, westward to California, where its range is over the warmer parts of the State.

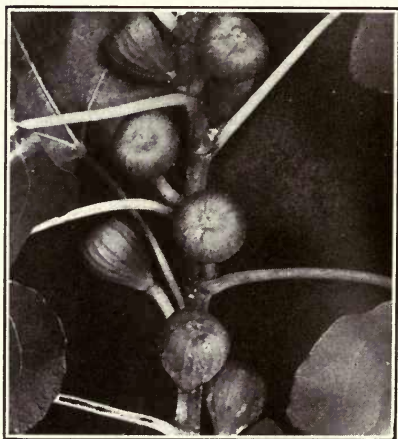


Fig. 89.—Figs are borne in the axils of the leaves

In the Southeast the plants are scarcely more than large bushes; in California they become trees, some of which exceed nine feet in girth, reach more than 80 feet in height, cover a circle of ground over 200 feet and bear a ton or more of fruit annually.

North of Baltimore the plants are dug up with large balls of earth, potted in late Fall and stored in a rather dry cellar until Spring, when they are replanted out-of-doors. From Norfolk, Va., southward to the Carolinas they are often trained low so as to be bent to the ground in the Fall and covered during Winter with straw and boards, though near the sea and from Georgia to Texas they need no such protection.

Propagation is by means of well-ripened wood cuttings four or five inches long, cut through the nodes and during late Winter or early Spring set in the ground with their upper ends level with the surface. Plants started thus and well managed should begin to yield in three or four years, sometimes in two. Southern and California nurseries offer plants of leading varieties briefly described on page 129.

Throughout the South moist, heavy soils are considered best, though for home plantings lighter soils, if well packed or if close to dwellings where other plants have not been allowed to grow, give good results. Moisture in the soil is essential. Figs are almost sure to fail on dry soils. In sandy soils they are likely soon to die from the attacks of nematodes (eel worms) which live upon the roots; in heavy soils they thrive in spite of these worms.

In the Atlantic and the Gulf States Figs may be set 10 or 15 feet apart; in California 40 or 50 feet because of the larger size to which the trees grow. Planting is done in January or February in the more Southern States; March or April farther North. Special care must be taken to prevent drying of the roots. Figs in the Southeast are trained in bush form, with three to five stems, as losses due to frost are thereby reduced; in the Southwest usually with only one trunk. For the former method the plants are cut back severely when set in the ground. Pruning consists in removing unnecessary suckers, dead, injured and crossing branches, and in shaping the bush during the first three or four seasons. Branches should never be cut to stubs but always entirely removed—back to the point of their origin. The less pruning of the Fig the better.

Since Figs are shallow-rooted, no plowing or digging near the plants is possible. After the first year or two cultivation must also be of the shallowest nature near the plants. In home plantations the scuffle hoe is perhaps the safest tool to use. Tillage should start when growth starts in Spring and continue till Midsummer, or later for late varieties. Manure and commercial fertilizers may be applied freely.

Southern Figs are mostly used fresh or canned; few if any are dried. California Figs are used in all three ways. The fresh fruit is of honey sweetness and of a peculiar flavor often not at first relished by Northern people, but very much enjoyed by people who like sweet fruits. In California about thirty varieties are very popular either commercially or in amateur plantings. Among these are the following, which are also popular in the Southeastern and the Gulf States. None of these need artificial pollination as the Smyrna Fig does. Because of this fact and the difficulties in the way of its successful cultivation Smyrna Fig growing is not discussed in this volume.

BLACK ISCHIA. A late bluish black, creamy white fleshed variety of good flavor. Though a strong grower it is not fully hardy or very prolific.

CELESTE. Early, violet to purplish brown, white fleshed, juicy, sweet and of excellent flavor. Remarkably hardy. Specially valuable for canning.

TURKEY (Brown Turkey). A very hardy and prolific mid-season, brown, pear-shaped, medium fruit with white flesh of excellent quality.

Other good varieties are **BRUNSWICK**, **WHITE GENOA**, **WHITE ISCHIA**, and **MAGNOLIA**. The last is the favorite for canning in the Gulf States.



Fig. 90.—Every twig of the Gooseberry bush looks like this

GOOSEBERRY

If there is any fruit more often mismanaged in America than the Currant that fruit is certainly the Gooseberry (Fig. 90). Like the Currant, its bushes are stuck in out-of-the-way corners and fence rows where they fight as best they can against their arch enemy, "witch," or "quack" grass (Fig. 91), where the worms are encouraged to regale themselves upon the tender foliage, and where the sparse and stunted fruits wave distress signals from their defoliated stems until discovered and rescued. Perhaps the fear that the worms will get them, but more likely because of ignorance on the discoverer's part, the berries are gathered while "green as grass" and made into callow tarts or verdant jam which, however, generally pales to a jaundice yellow.

In spite of this program of mismanagement these culinary products are fairly edible—if the cook understands her business.

But why not give the bushes good care and pick the berries when they are more mature, better flavored and require less sugar to make them palatable? Indeed, why not let them ripen fully, as the English do, for eating out of hand? Only because people have become accustomed to



Fig. 91.—Quack grass is one of the worst enemies of Currant and Gooseberry bushes

"the old way of doing," not because the Gooseberry is incapable of better things.

As a family fruit plant the Gooseberry has special claims. It is easy to grow anywhere, except in warm climates (even to the Arctic circle!) since it is wonderfully hardy. Though blossoms and foliage (Fig. 92) often appear before the snow has all gone they are not injured by the cold. With ordinary good care it will yield annually for ten or fifteen years. It is highly productive, a well-grown, well-managed bush, yielding half a peck to a peck (four to eight quarts). So half a dozen bushes should give an ample supply for the ordinary sized family. The fruit may be used while only two-thirds grown, when fully mature or when "dead" ripe, during a period of three to six weeks. In the home garden (Fig. 93) it may be gathered at any of these stages of development; but in the market never except in the greenest condition. Furthermore, the intensive and more or less shaded condition of the home garden is far more favorable to it than is the open berry field.

Because of this last point the home garden is just the place to try the culture of English Gooseberries, which with few exceptions have been proved unprofitable as commercial ventures in America, because under sunny and dry conditions they are much more subject to mildew attacks than are American varieties, especially on light soils. The moister, more shaded and cooler conditions of the home garden and heavy, cool soils make it possible to grow these splendid varieties in America, particularly where the early Summer climate is cool and moist. As grown in England many of these produce fruits as large as hen's eggs, often weighing two ounces each. They are largely eaten like plums out of the hand when fully ripe, though great quantities of ripe ones are also made into jam. Can you name a rival of ripe Gooseberry jam?

As the varieties are so much superior to American kinds they should be given at least a trial in our home plantations. Fortunately, Robert B. Whyte, an amateur grower, reported to the American Pomological Society his methods and successes with nearly 50 varieties in his home garden at Ottawa, Canada. His successes will appear all



Fig. 92.—Gooseberry flowers

the more remarkable when it is remembered that in America English varieties are reputed to be very subject to mildew, but that for more than 25 years Mr. Whyte has not sprayed for this trouble, because he could discover no advantage in so doing. He does spray, of course, for Gooseberry worm; but that's a different story altogether. Before quoting Mr. Whyte it may be stated that in Niagara (Ontario) distinct English Gooseberries have been commercially successful on heavy soil when sprayed for mildew with lime-sulphur wash.

The factors that favor success are highly fertile, heavy soil, moist air and cool temperature. There is no use in attempting to grow Gooseberries unless you have a heavy clay loam, retentive of moisture

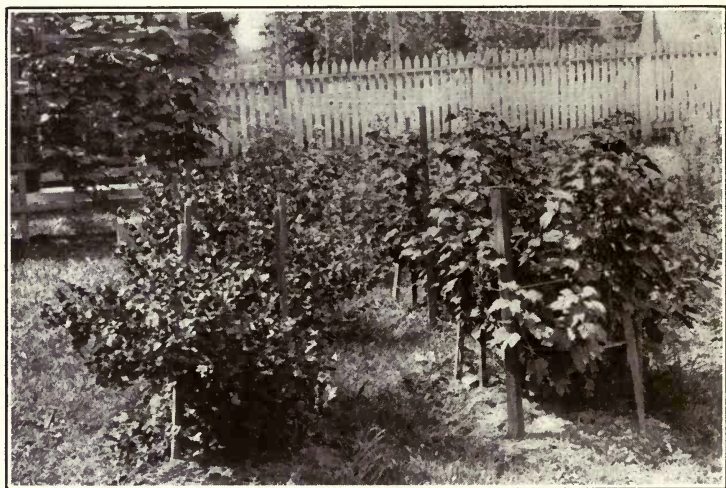


Fig. 93.—A trio of home-makers—Grapes, Gooseberries and Currants

and dark in color. In England they are not satisfied with turning the soil a spade deep, but they dig it two feet deep. At the bottom of the trench they manure heavily to have a substratum of fertile material that lasts for many years. One of the evils of light soils is that the roots run along close to the surface. Thus the roots are burned by the sun's heat. To equalize the temperature plant the bushes in partial shade, not under, but in the shade of buildings or trees, so they will have protection part of each day from the excessive heat of the sun. In very dry weather the ground must either be mulched, preferably with manure, or the bushes watered; the former is the more practical, though it may often be unsightly.

Gooseberry bushes imported from England are three years old, 10 to 12 inches long with one straight trunk as thick as a finger, a clump of roots at one end and a cluster of branches at the other. In Canada they sometimes cost as little as 10 cents each, in the United States perhaps twice as much as a rule for the same varieties. The object of this tree form is to insure the absolutely necessary free circulation of air beneath the branches. English growers never allow Gooseberries to sprawl over the ground to encourage mildew.

As this form is difficult to maintain, Mr. Whyte tried other methods of training. He never allows shoots to develop from below ground but encourages the development of only three or four main branches from the upper part of the trunk. All growths on these branches are either shortened to "spurs" three or four inches long or removed entirely. Thus there is a circle of short branches around each stem. All shoots inclined to grow along the ground are cut off as soon as discovered and all that grow too lustily are pinched back while their tips are soft in Summer. As soon as the crop has been gathered is a better time than in the following Spring to prune for next year's crop. Better fruit and better success follow late Summer pruning because in Spring pruning more or less fruiting wood is destroyed, whereas in Fall pruning its formation is encouraged.

It is not wise to cultivate at all deeply around the plants in Spring. Whatever digging is necessary should be done the latter part of September or early October. At that time the bushes are slowing down for Winter, so injuries are not only less serious, but the bushes recover better than if they occur in Spring when the plants are active. Mr. Whyte reports fifty per cent. better crops by following this plan. Any cultivation in the Spring to keep the surface soil loose and prevent weed troubles should be done very shallow. A scuffle hoe is excellent.

Of the nearly 50 varieties he grew, Mr. Whyte speaks as follows: "The general classification of berries by nurserymen is white, green, yellow and red, the last two groups being the most popular. Of the white the **KEEPSAKE** is a heavy cropper of large, fine-flavored berries. **WHITE** is inferior in quality to **KEEPSAKE** but very resistant to mildew; **TRIUMPH**, so closely resembles **WHITESMITH** there is no need of growing both." (Mr. Whyte does not comment on **WHITESMITH**, which is perhaps the best known English variety grown in America, a large, yellowish white variety of excellent quality.)

Among the green kinds, **DELAWARE** is one of the very best, a large, fine-flavored berry; **LOFTY** has been continuously satisfactory for twelve years, a rich, fine-flavored fruit; **OVERALL** is also a delicious berry. The yellow varieties include **WETHERALL**, a dark greenish yellow fruit of exceedingly high flavor. **ALMA** is "another very large

and fine berry." The reds include SLAUGHTERMAN, one of the most highly flavored; VICTORIA, a smaller fruit bears enormously and is very good in quality; LONDON RED "produced more large berries" than any other variety Mr. Whyte has grown; SPORTSMAN, "delicious flavor when ripe."

Possibly the most successful seedling of American development is RED JACKET (or JOSSELYN) "but it is inferior to good European varieties. * * * The fact that our American varieties have little or no flavor compared with European varieties I think precludes the immediate hope of getting a really good Gooseberry by using our native varieties. * * * If we are ever to have Gooseberries growing all over this country as we have the DOWNING, it is only by growing generation after generation of seeds from the best English varieties and by selecting those varieties that are hardy, that withstand mildew better than the others and that hold their leaves till the end of the season."

After noting Mr. Whyte's success, methods and recommendations it may seem that little can be said in favor of our American varieties. It must be remembered, however, that these are the ones now most widely grown in this country, mainly because they will stand haphazard

management, even neglect. Doubtless Mr. Whyte's methods should apply equally to them, but apparently these have not been tried. The best method so far recommended is to allow two, or not more than three, young shoots to remain in each bush, each Spring, and to cut out the stems that after four or five years of bearing show signs of failing (Figs. 94, 95).

The American varieties that have attracted more than passing attention are the following: POORMAN, large bushes bear large excellent flavored berries in abun-

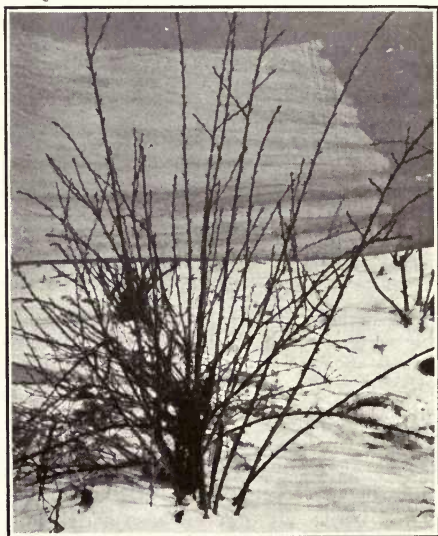


Fig. 94.—Gooseberry before being Spring-pruned and thinned

dance; PEARL, bush fairly vigorous, fruit medium size, fair quality; DOWNING, bushes vigorous, prolific, fruit pale green, soft, juicy; most widely grown American variety; JOSSELYN (RED JACKET), bush vigorous, erect, prolific, fruit pale red—"the one large Gooseberry that can be planted with confidence." Besides these are several varieties with more or less European "blood" in them. The best known are probably: CHAUTAUQUA, a pale green, excellent flavored, fruit borne more profusely than on INDUSTRY; INDUSTRY, a large, fleshy, dark red, delicious berry—"the most successful English variety of American development."



Fig. 95.—Gooseberry after Spring-pruning and thinning

Goumi

A hardy Japanese shrub, five or six feet tall, called Goumi or Gumi and botanically known as *Elæagnus multiflora* or *Elæagnus longipes*, would bear a profusion of berries from June to August, if the birds would allow it to. Generally, however, "our feathered friends" hold a convention in the bushes just when the fruits are ripe and leave a "Scotch plate"—nothing to eat—when they adjourn, *sine die*.

The shrub is excellent for planting on lawns because of its good form, its fragrant though inconspicuous flowers, but more because of its leaves, which are green above and silvery-brown dotted white below. To all this add the glossy, crimson, dotted berries and the plant is certainly a thing of beauty. The fruits are decidedly astringent until fully mature, when they become spicy, slightly acid and pleasant to the taste. Mr. Hamblin says they are like small, red Plums with the acidity of Red Currants, but differing from either. For eating out of hand and for preserving they are excellent. They make good jam and jelly, either alone or mixed with other berries.

The Goumi will thrive in almost any well-drained soil. It does best in a sunny situation. After once being planted it needs even

less attention than a Lilac or a Currant bush, so for a novelty both as an ornamental and a fruit-bearing plant it deserves a place on the lawn. It is ornamental in leaf, flower and fruit and is not troubled by bugs or diseases. Unfortunately, plants of two or three related species are sometimes substituted for the true *Elæagnus multiflora* (*longipes*). As the fruit of these is inferior to the genuine they are useful only for ornament.

GRAPE

Of all fruits the Grape exhibits the most Christian spirit, since it returns a far greater measure of good for evil than does any other. Under neglect Strawberries, Raspberries and Blackberries yield nubbins or nothing; Currants and Gooseberries shake their gaunt and naked canes as warning fingers at their neglectors; and the tree fruits petulantly fling their distorted, wormy, scabby specimens as mute recriminations on the ground. Not so the Grape; in spite of the most wanton neglect accorded any plant it smilingly reveals its forgiveness by presenting fruit to its owner as a silent plea for reasonable feeding and care (Fig. 96).

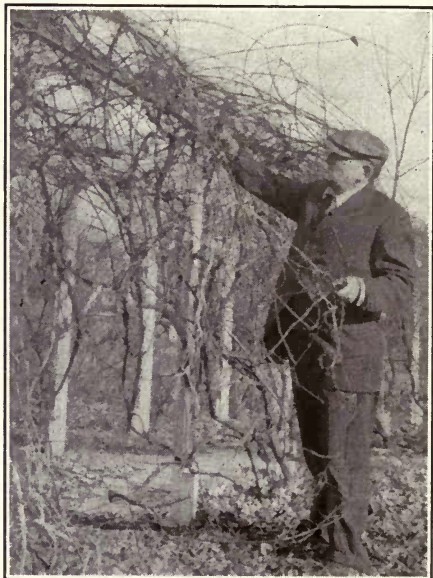


Fig. 96.—Grapes on ordinary trellises require an extraordinary amount of pruning

You fear the pruning, eh? Cast your fears aside. The Grape is the most forgiving plant in the world. It will bear in spite of unscientific pruning. If that isn't reassuring enough, remember that it bears in nature even when no knife, saw, shears, or other pruning implement comes within miles of it! Furthermore, remember that even though perhaps you don't quite understand and don't follow exactly the method insisted upon by John Doe or Richard Roe, neither one of these famous gentlemen knows as much as the vines do! So in spite of what you may

consider mistakes you may expect fruit. The canopy or Munson method, described on page 139, is almost as simple as neglect! It merely suggests to the vine that better results can be secured by a little judicious control than by natural waywardness.

No other fruit so richly deserves the small attention necessary to make it bear lavishly. From the earliest historic times only two other fruits, the Date and the Fig, have rivalled it as a wholesome human food, a position it still holds because of its richness in sugar and muscle-forming components as well as its nicely blended acids



Fig. 97.—It is not necessary to have a fancy trellis in order to have plenty of good Grapes. If you can, count the clusters still on the vine!

and its aromatic flavors. Still further, no other woody fruit plant, not even the Apple, can be grown in so extensive a territory, upon such a variety of soils, begin to bear so soon and continue for so many years, or supply fresh fruit for so long a season in such a wealth of colors and flavors, or whose surplus can be handled in such a variety of ways. Some variety of Grape will succeed under home conditions in every State of the Union and with adequate protection probably in every Province of Canada.

Reject the idea that it is hard to manage. It is not! Such a misconception is due to the literature on its commercial culture. To be commercially profitable it must have this and that, be managed thus and so, or the grower will not build a big bank balance thereby. To have an ample family supply we don't need to follow commercial practices if we don't want to. Even the marplot and the blunderer are almost powerless to prevent the more determined varieties from bearing their burden of fruit. Instead of trellises we may train the vines on stakes, on arbors (Fig. 96), on lattice screens, on fences, on the sides of buildings and even on trees if we wish. Who and what are to prevent? Mr. Business Vineyardist or Mrs. Grundy? To be sure we may not always get exhibition specimens or perhaps quite as good fruit by some of these crude practices, but if such considerations are to deter us what fruit of any kind shall we get?

■ The Grape does well on well-drained soils of any kind, though for most varieties soils with large proportions of clay give better results than those in which sand predominates. Always the situation should be such that the vines have full sunlight during at least half the day. If the soil is poor a hole as deep as a nail keg and as wide as a wash tub may be dug out, or preferably, a trench four or five feet wide and two feet deep prepared by removing the earth, providing drainage, dumping in a bucket full of old bones for each vine—the more the merrier—covering these with good earth and planting the vines.

Two-year vines are preferred by most planters because these uniformly give better results than older ones. Well-grown one-year vines are also good. There's no need to pay "fancy prices" for vines. In the price list of one of the leading Grape nurseries only one out of nearly seventy standard varieties costs over 30 cents, and only five that much; whereas 20 cost 15 cents, or less, for *two-year-old vines*. Whether set in Fall or Spring is immaterial in most parts of the country. In the former case the vines should not be cut back until Spring; in the latter the tops should be reduced to three or four buds. Most planters shorten the roots. I don't, unless they are injured or dry, because I want them to reach the bottom as well as spread out well in the hole. Of course it costs more in time and effort to plant them, but for an amateur vineyard I'd rather waste a little extra elbow grease than impair my chances of having the vines root deeply. Some men also recommend a mulch the first year or two. I don't, because that encourages shallow rooting. The deeper the roots can be made to extend the surer will the vines be to have a good supply of water. Clean, shallow cultivation will keep down the weeds and prevent undue loss of moisture. When the vines begin to bear heavily

will be time enough, if ever, to mulch. Then extra roots near the surface may be encouraged.

During the first season only the one or two strongest shoots should be allowed to grow. These should be tied to stakes about six feet long above ground (Fig. 98). After the leaves have fallen, or at earliest fully two weeks before the sap starts the following Spring, the best cane (that is, shoot) of each vine should be cut back to two buds and all other growths cut off entirely. By cutting back in this way all the energy of the plant will be concentrated in the one to three shoots that develop from the buds. It may still further be concentrated if after the bases of the shoots have become woody the inferior ones are cut off entirely, thus leaving only one to utilize the plant food.

If to be trained on a building, leather strips may be used to fasten the vines, but wires held six or eight inches away from the wall by long shanked screw eyes will make a neater job and give better circulation of air. If to be trained on an arbor stakes will answer well the first season. In this

case the arbor need not be built until the Spring of the third year, though strong vines may have the arbor built the second season.

Many styles of trellises are in use. The one I prefer, recommend and herein describe, is the canopy or Munson style, because it provides a canopy of leaves over the vines and fruit high enough above ground to admit free circulation of air and sufficient light to favor fruit development and ripening. If an additional foot be added to the height, Currant and Gooseberry bushes may be planted between the vines beneath the trellis, thus providing these bushes with the partial shade they need in warm localities. Furthermore, this trellis is easy to pass under if one must chase his neighbor's hens off the premises!

Among the conspicuous advantages that the canopy trellis (Fig. 99) has over other trellises are simplicity, cheapness, ease of doing all



Fig. 98.—First season in the vineyard. Ready for trellising next year. Buckwheat cover crop in row

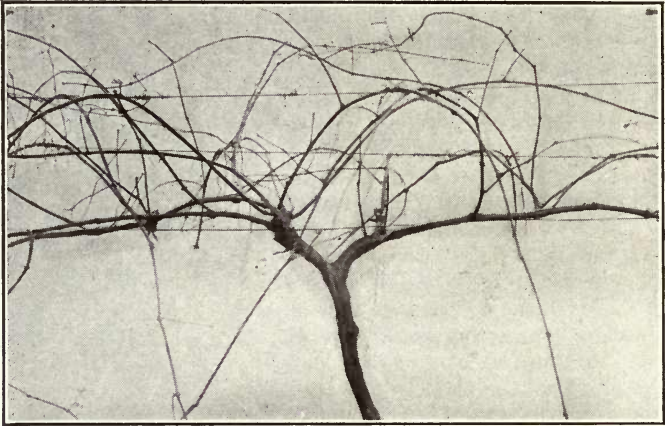


Fig. 99.—Munson system of Grape training. Vine unpruned. See same vine pruned (Fig. 102)

necessary work—pruning, tying, spraying, harvesting—without stooping, perfect distribution of light, warmth and air, shading fruit from the sun, hiding it from the birds and reduction of wind damage. There are others, but aren't these enough?

Trellises if set parallel should be not closer than eight feet apart. If the lines are long—100 feet or more, the end posts should be five or six inches at the small end and the line posts three to five. Their lengths will vary with the locality. They should be long enough to extend at least four feet above ground and several inches below the "first line" in the ground. End posts should be braced to offset the pull of the trellis when loaded with fruit. The posts should be 24 to 30 feet apart. Robust growing vines may be set 10 feet apart, moderate growers eight and small ones six. Thus there should be three or four vines between posts.

After the posts have been set a three-eighth-inch hole is to be bored in each, six inches below the top. Through these a No. 11 galvanized wire must be drawn, fastened at one end and provided with a tightening and loosening device at the other. This is the only wire needed at first. It may be put up at the beginning of the second season for strong growing vines or the third season for weak ones, the latter being grown on stakes two years in succession. A stout cord must be tied to the stump of each vine left after pruning and the upper end tied to the wire so the cord is taut. Up these the shoots will climb with only occasional encouragement to twine.

To detail the growth of the vines year by year: At the beginning of the second year exceptionally sturdy vines, those that have made a growth of five feet or more, may be cut back slightly and allowed to develop one strong shoot in each direction along the wire, all other shoots from lower buds being nipped off while soft and green. The shoots so developed may be allowed to bear one or two clusters of Grapes each. Moderate growing vines must be cut back to 18 to 24 inches and only one shoot allowed to grow up and stretch upon the wire. All fruit clusters must be cut off so as to concentrate energy. The following year (the third) these vines may be allowed to grow like the sturdy ones did the previous year. Very weak growing vines may have to be cut back twice (two different years) before reaching the bearing stage mentioned.

Annual Winter pruning is simple. Each year, preferably early in the dormant season, November to February, the canes that extend along the wire must be cut back, leaving twelve to sixteen buds on strong vines (six or eight on each of the two horizontal canes on the wire) and only four to six on the weak vines. After being pruned each cane must be firmly tied in two places to the wire around which it should be coiled once or twice.

At the beginning of the second season after the trellis is started cross pieces of 2 x 4 scantling and 24 inches long are to be spiked or wired to the tops of the posts (Fig. 100). An inch from each end on their upper sides, shallow slits (one-half inch is deep enough) are to be sawed for the two other trellis wires to rest in. These wires are to be stretched taut and fastened at the ends like the first. They are for the Summer fruiting shoots to rest upon and hang from.



Fig. 100.—Munson or Canopy trellis seen from the end

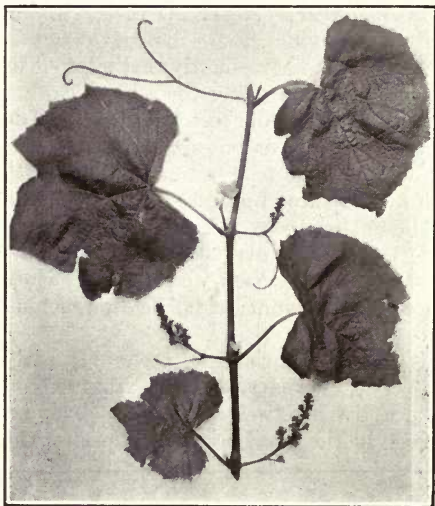


Fig. 101.—Section of Grape shoot showing flower clusters and tendrils

Summer pruning is as simple as Winter pruning. First, a few days before the Grapes begin to bloom, cut off with a sharp knife the tips of the shoots that are to be allowed to bear fruit, leaving two or three leaves beyond the outermost cluster on each (Fig. 101). Second, at the same time pick out two sturdy shoots, which start from near the crotch. Make them extend right and left. These are to replace the canes grown the previous year and from which this year's shoots and fruits have developed. To make these canes still stronger remove all the

flower clusters from them. Third, remove all shoots that start to grow on the main trunk below the crotch, because they will rob the bearing part of the vine of food and bear nothing in return. Fourth, a week or ten days after the work just outlined in 1, 2 and 3, inspect the vines and shorten the shoots not previously cut back. Fifth, by this time the shoots previously clipped will probably have pushed out new shoots from their outermost buds. Clip these back to one or two leaves. Then wait for the reward of fruit. It's as easy as it sounds!

After the vines have begun to bear, the pruning during the dormant season is as follows: Second bearing year. Cut off the arms that produced the bearing shoots the previous Summer just beyond the starting point of the two new sturdy canes (Fig. 99). Avoid injuring these two new canes when removing the other wood. Shorten these canes in proportion to the strength of the vine, leaving three or four buds on each for weak growing varieties such as Delaware and six to ten for strong ones and gently braid them with and tie them to the lowest wire (Fig. 102). Each of the buds left on these canes should produce a shoot and each shoot two or three clusters of Grapes.

The Summer pruning is the same each year from now forward, but a larger number of strong shoots may be deprived of their flowers

to develop arms, as the main branches are generally called. Weak growing varieties may have four such arms 24 to 30 inches long; very strong ones four, six or eight feet long, two of these being gently braided with the lower wire in each direction and tied loosely in two or three places. Here we see the reason for the varying distances between vines: small growing varieties may be planted as close as six, but better eight-feet; large ones 10 to 15.

Cultivation is the same as for other fruit crops, except that it must be no deeper than for Currants, Gooseberries and other shallow-rooted plants. The surface should be kept loose and open at least during the first two years, when a mulch of straw, leaves—anything—deep enough to prevent weed growth may be applied. If a liberal bucketful of

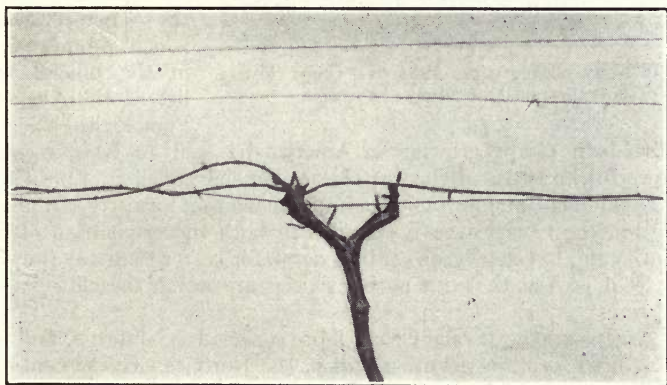


Fig. 102.—Munson system of Grape training. Vine Pruned

bones has been placed beneath the roots of each vine no further fertilizer will be needed until the third or fourth year, when bone meal may be applied at any convenient time. Other good fertilizers to apply are unleached wood ashes, phosphate rock and, in case of yellowish foliage and short growths, some nitrogenous fertilizer—this always in Spring. Such fertilizers as manure of any kind and nitrate of soda are best.

GRAPE VARIETIES

The growing of American Grapes is a development compassed by the memory of men still living. Though countless attempts had been made since colonization days to grow European varieties they had failed, mainly because the vines fell victim to disease or to a plant



Fig. 103.—By placing paper sacks over Grape clusters finer though later fruit may be secured

louse called phylloxera; and though several varieties of purely American origin had been named and disseminated they were, with almost no exception, of such poor quality that they soon passed out of existence. Not until the Concord was placed among the "new varieties which promise well" in the official fruit list of the American Pomological Society

in 1854 can Grape growing in America be said to have received a powerful impetus. Being, as Horace Greeley called it, "the Grape for the millions" and a wonderful improvement on formerly introduced varieties, the Concord gave stimulus to both the origination of new varieties and to Grape growing in general, for better than any previous variety it proved that our native species are worth the efforts spent on them.

Except on the Pacific Coast, more especially California, and in a few favored localities in other States, the European Grape continues to fail unless grafted upon stocks which are not harmfully affected by the phylloxera. Hence no attempts should be made to grow any of these varieties anywhere upon their own roots. As their hybrid progeny are more or less constitutionally weak or partake of the susceptibility of the parent to disease they are distinctly amateur, not commercial, varieties. Several of them are of high excellence and are well worth planting in family vineyards, especially to add diversity of flavors to the list and to extend the season.

Most people believe that Grapes have a season of only a month or so. This is because they grow, or know, only one, or at most very few, varieties which being in small supply are gobbled up promptly. Yet a moment's thought should remind them that in New York, Boston, Chicago and other large Northern cities Niagara and Concord are usually seen in the fruit stores until Thanksgiving Day and Catawba until Christmas and New Year. Those who give all the credit to commercial cold storage will doubtless be astonished to learn that Grapes

of properly chosen varieties may be kept under ordinary home storage conditions until Easter, even when that festival, due to the vagaries of the moon, falls in late April. Thus, since the Concord bore its first fruit in 1849, American varieties have been developed to cover a season excelled in length among Northern fruits by no other fruits than the Apple and the Pear, fruits which attracted pomological notice centuries before America was discovered!

Among the score or more of Grape species described by botanists several indigenous to America have been used in the origination of the two or three thousand varieties named and disseminated during the past century. The great majority of these have been produced in the Northeastern quarter of the United States and adjacent Canada. Many important ones have been developed in the Mississippi Valley

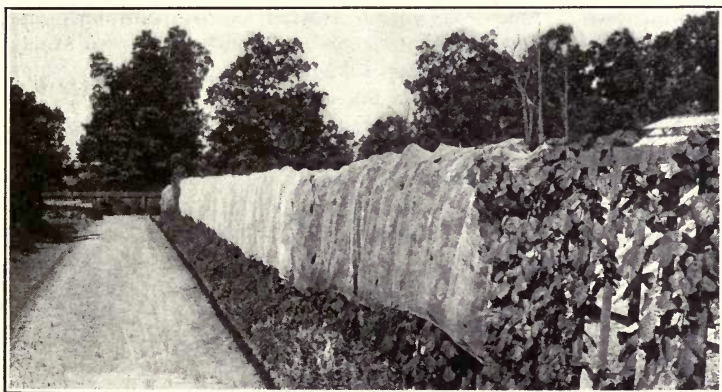


Fig. 104.—Protecting Grapes from attacks of birds

and the Southeastern States; many more in Texas, mainly by the late T. V. Munson; others in California and elsewhere. To a large extent these varieties are best adapted to the regions in which they originated; often the Northern varieties fail or do poorly in the South and vice versa. It is, therefore, advisable to bear such points in mind when choosing varieties for planting, first choice being given to varieties known to succeed in the neighborhood or the region in which the vines are to be grown. More than with, perhaps, any other fruit the plants should be purchased from nurseries in the same region so as to get varieties suited to the locality.

Since the great majority of family fruit planters live in regions where the Northern varieties succeed best a large proportion of the

kinds discussed briefly herein are suited to this region. The South, and the Central Southwest are, however, not forgotten. Nevertheless, it must be said that the varieties known to succeed there are fewer because less has been done in those sections. As to California, it seems advisable to give only very brief comments on the more important or well-tested varieties. Some of these have been tentatively tried in the East during the past few years, the idea being that when grafted on phylloxera-resistant roots, properly sprayed and protected during Winter, they may succeed where they formerly failed. Mr. R. D. Anthony of the New York State Experiment Station suggests nine varieties concerning which he has written me that most of them have ripened at Geneva under normal conditions and that he believes they will do much better on Long Island. So far I have not had a chance to grow them. The varieties are: Buckland Sweetwater, Chasselas de Fontainebleau (White Sweetwater), Dattier de Beyrouth (Rosaki), Feber Szagos, Golden Champion, Gradiska, Joannenc or Ligan, Malaga and Sultanina Rosea. So far as I know, the European varieties are obtainable only from California nurseries.

T. V. Munson, in *Foundations of American Grape Culture*, says that certain European varieties (marked with an asterisk in the following list), "if grafted upon the good resistant native Grape roots, and the vines carefully sprayed with Bordeaux mixture, will succeed all through the South to about the thirty-fifth parallel [the Southern boundary line of Tennessee]. In the Northern parts of this region Winter protection will be needed. A covering of straw, leaves, stalks or weeds will be sufficient. In the moister regions it will be much more difficult to succeed with these kinds than in the arid regions, and their quality will be much better in the drier parts." The same writer has also proved the following varieties suited to the same region: Calabrian, Griesa de Piemonte, Perle of Anvers, Quagliano, Muscat Rose, Sauvignon, Jaune, Semendia, Verdhelho and Violet Chasselas.

Mr. Anthony, when addressing the New York State Fruit Growers' Association two years ago, gave the following suggestions as to growing the European varieties in New York and other cold parts of the East:

"Both because of the necessity of laying down the vines in the Winter and because of different habits of growth [from American varieties] we are finding it best to modify the usual methods of Grape pruning. When the scion starts into growth two shoots are saved and when these are pruned in the Fall the lower one is cut to a spur of two buds and the upper one is cut at the lower wire [which is 18 to 24 inches from the ground, the trellis being a different style—two or three wires one above the other]. Each Fall the lower growth is cut to a

spur and the shoots on the trunk at the lower wire pruned with a new arm to the right and left along the wire with renewal spurs at their bases. When the trunk becomes too old and stiff to bend down easily, a shoot is brought up from the spur at the base of the trunk and the following year the old trunk is cut off.

"The growing shoots do not have the horizontal or drooping directions of most of our Grapes, but have a stocky, vertical growth. When they have reached the top wire they are tied to it and the tips broken off just above the wire. At the same time all secondary shoots which have started at the bases of the leaves opposite or below the flower clusters are broken out. The buds near the top wire will start a second growth. When this gets four to eight inches the tops are cut off with a grass sickle. In years of vigorous growth it may be necessary to repeat this cutting back.

"Winter covering is a minor item. As soon as the vines are pruned three men start down the row. One bends the vine to the ground while the others mound up the dirt three or four inches over the bent trunk."

EUROPEAN VARIETIES

(Dates of ripening are for South Central California. Asterisks indicate varieties suited to the area between South Carolina and Texas—the Northern limit being about the thirty-fifth parallel of latitude as indicated in the discussion.)

ANGULATO. Clusters large, dense; berries large, bluish black, firm, juicy, sweet. August.

ASSOUAD ZEINE. Clusters loose; berries dark red, large, showy, excellent. August.

BLACK CORNICHON. The large to very large purple or dark red, fair quality berries are borne on medium to large, long clusters during October.

BLACK HAMBURG (Frankenthal). Clusters large; berries large, black, juicy, sweet. Late September. Famous old European variety, considered standard of high quality by variety originators.

BLACK MONUKKA. Clusters large; berries uniformly small, black, excellent, seedless. Except in color closely resembles Sultanina. August.

BUCKLAND SWEETWATER. Clusters medium size, dense; berries yellow, medium. August.

***CHASSELAS DE FONTAINEBLEAU (White Sweetwater).** Clusters large; berries yellow, juicy, sweet. Late July. An old variety highly valued wherever European Grapes can be grown.

DATTIER DE BERGROUTH (Rosaki). Clusters large, loose; berries very large, amber, fleshy, juicy, sweet. August. Long keeping.

DROUKANE. Clusters very large, compact; berries red, firm, high quality. November.

***FEBER SZAGOS.** The large clusters of very large, whitish-green, excellent quality berries ripen in September on vines of exceptional vigor.

- FLAME TOKAY.** The large, pink, firm berries borne in very large clusters, are of excellent quality when well ripened in September.
- GOLDEN CHAMPION.** Clusters large, berries large, juicy, fine flavored. August. An old variety that has stood the test of time.
- GRADISKA.** Clusters large; berries greenish-white, excellent. September.
- GROS COLEMAN.** Clusters large; berries very large, firm, fine flavored. November.
- GROS GUILLAUME.** Clusters medium size; berries black, waxy, very large, excellent. Early September to mid-October.
- JOANNENC or LINGAN.** Clusters medium, compact; berries golden, medium size, juicy, sweet. Early July.
- *MALAGA (Pense).** The large to very large yellowish-green, juicy, sweet berries are borne in large clusters during August.
- MARAVILLA DE MALAGA.** Clusters long, loose; berries red and blue, large, excellent, long keeping. October.
- *MUSCAT (of Alexandria).** The very large, long, loose clusters carry large to medium-sized pale, amber-colored berries of moderate juiciness, sweetness and richness. September. This variety is the famous source of Spanish Muscatel raisins.
- OHANES D'ALMENA.** Clusters medium; berries yellow, excellent. November.
- OLIVETTE BLANCHE.** Clusters medium, rather loose; berries amber-green with brown cheek, firm, crisp, well-flavored. October.
- OLIVETTE DE VANDEMAIN.** Clusters large, loose; berries yellowish-green. Resembles, but is better than the Spanish Almena. October.
- *ROSE OF PERU.** The medium-sized, dark-purple, high-quality berries are borne in large clusters during October.
- *SULTANINA (Thompson's Seedless).** Bears medium-sized, yellowish-amber, high-quality berries in very long, loose, large clusters during August. Excellent for raisins as well as dessert. A sport called Thompson's Seedless Improved has berries double the size of the parent.
- SULTANINA ROSEA.** Except that the berries are red, this variety is identical with Thompson's Seedless.

AMERICAN VARIETIES

- AGAWAM.** A self-fertile, vigorous variety with large clusters of large, red, rich, sweet, aromatic berries noted for long keeping. Follows Concord; may be kept till January. Does best on heavy soils.
- AMETHYST.** A comparatively new, excellent, almost fertile, dessert, long-keeping variety which follows and resembles Delaware in growth, fruit and hardiness, but is stronger growing.
- BARRY.** One of the best black varieties. The vigorous, hardy, prolific vines bear clusters of various size and shape with large, sweet, delicately flavored berries which ripen a little after Concord but keep in ordinary storage till March.
- BRIGHTON.** Beauty, high quality, sureness of maturing, vigor, prolificacy, adaptability to wide range of soils make this large, early red Grape a leader. It is, however, more self-sterile than perhaps any other variety and its fruit rapidly deteriorates in quality after reaching maturity.

In no family plantation have I known this defect to manifest itself, the fruit being eaten up too promptly.

CACO. A rather new variety which ripens earlier than its parent Concord, but resembles its other parent Catawba in being red. The vigorous, hardy, healthy, prolific vines bear medium-sized clusters of large, rich, sugary berries.

CANANDAIGUA. A comparatively new black variety, which though very good when mature seems to improve, or at least not to deteriorate, under storage. In tests at the New York Experiment Station it has been kept in ordinary storage until mid-April! Its high quality and beauty also recommend it.

CATAWBA. Wide adaptability, high quality, beauty, lateness, long keeping (March), vigor, hardiness, prolificacy, recommend this famous old red variety, which should be among the first to be chosen.

CLOETA. According to its originator, T. V. Munson, is "probably the best of all American black Grapes." But since it "requires hot, dry weather to acquire high quality" it is not a variety for Northern planting. The very vigorous, hardy vines bear small to medium irregular clusters of small to medium black berries.

CONCORD. The most extensively grown American Grape. Popular because of its adaptability to diverse soils, annual prolificacy even under neglect, hardiness, comparative earliness, hence fair certainty of ripening, large size and beauty of cluster and fruit. It is however of only moderate quality since it lacks richness, delicacy and aroma and is strongly "foxy." Moreover, it is a poor keeper, losing flavor soon after gathering. There are so many better varieties that this one should not be added to the home vineyard until at least twenty other varieties had been given preference. In my own home garden I have not planted it, though I planted twenty-three other varieties!

CROTON. A Delaware descendant, though finicky as to soil, of poor growth and tender to frost, is excelled by few if any "white" Grapes. Its late, sweet berries hang until frost and keep till Midwinter.

DELAWARE. The *ne plus ultra* of American varieties, the first to reach the high standard of Europe. Strong constitution, adaptability to varying climates and most soils, prolificacy coupled with beauty and flavor have made it also a leader in popular favor. It is also early enough to ripen with certainty where almost all other varieties mature. Objections to it are small size of vine, cluster and berry, and slowness to reach bearing age, but no family plantation would be complete without it.

DIAMOND. Earliness, hardiness, vigor, prolificacy, high quality and beauty make Diamond one of the best of Grapes. It ripens a little earlier than Niagara, to which it is superior, but which it somewhat resembles in color of fruit—green.

DOWNING is noted for high quality, beauty, long keeping, but its vines are tender to cold. Its large, purplish-black berries borne in medium to large clusters ripen somewhat later than Concord but may be kept till Spring. They are of excellent quality.

DUCHESS is notable for its beauty, delicious flavor and long keeping. The vine, however, is tender to cold and particular as to soil. Its "white" berries borne in large, compact clusters ripen in mid-season and keep well. The vines resent rich soil.

- EARLY VICTOR.** The highest in quality of early black varieties. The hardy, healthy, vigorous, prolific vines bear small clusters of small berries.
- EMPIRE STATE.** One of the four leading "white" Grapes. Quality better than Niagara and Pocklington but not quite equal to Diamond. The fruit ripens before Niagara, hangs well and keeps long after harvested.
- EUMELAN.** Probably combines more good and fewer undesirable points than any other black Grape—vines vigorous, hardy, prolific; clusters and berries large and beautiful, juicy, rich, sweet, delicious. Though early ripening the fruit keeps until January or February. Self-sterile.
- GAERTNER.** Beauty, high quality, large clusters and berries, vigor, prolificacy and hardiness of vine make this one of the best of varieties. But it is crotchety as to soil and requires special handling.
- GREEN MOUNTAIN.** (See Winchell.)
- HEADLIGHT.** A Munson hybrid, especially valuable for the South, though successful as far North as Ohio. Prolific, vigorous, high quality (approaching Delaware). Earliness and long keeping are two of its prominent attractions. Berries small to medium, purplish black.
- HERBEMONT.** A reddish-brown, Southern variety equivalent to Concord in popularity. Cultivated from Virginia to Texas, but not hardy north of Missouri. It demands warm soil, rich in humus and a long season in which to mature. Vine vigorous, healthy, annually prolific; fruit handsome, small, rich, sweet, high flavored.
- HERBERT.** One of the choicest of black Grapes, being vigorous, hardy, prolific, mid-season to Midwinter. Self sterile.
- HIDALGO.** A rather new, white variety of specially high quality, being rich, sweet, delicately flavored, as its parentage (Delaware, Goethe and Lindley) might imply. The berries ripen with Concord but keep longer.
- HIGHLAND.** A late Grape of very superior quality. As it ripens after Catawba it is not suited to short season localities. The vines also are not fully hardy but are highly prolific. When well grown under favorable climatic conditions the handsome clusters of large, black berries often exceed a pound and a half.
- IONA.** A red variety scarcely rivalled in delicate flavor or keeping quality by any other American kind unless by the Delaware when at its best. Though originating in New York, it is doubtfully hardy North of Westchester County, beyond which its fruit often fails to ripen. When the fruit does ripen it may be kept until Midwinter. Iona does best on sandy or gravelly soils.
- JAMES.** Cannot be grown successfully farther North than Delaware, and adjacent New Jersey, being the progeny of a distinctly Southern species. The vigorous, healthy, prolific vines bear clusters of three or four to a dozen large, black berries of highest quality. The fruit for two or three weeks after ripening and keeps well. Valuable for the Southeastern States.
- JANESVILLE.** A small, black Grape, worthless except in very cold localities where better varieties fail. Vines healthy, hardy, prolific, vigorous. If varieties as hardy as Concord fail, due to cold Winters, perhaps Janesville may live and bear fruit, for where there's life there's hope, even though the fruition may be poor.

- JEFFERSON.** Almost equal in quality to Delaware; has large, symmetrical clusters of large, red berries which ripen about two weeks after Concord. The fruit makes a fair raisin or keeps until Midwinter. Vines vigorous, fairly hardy, fairly prolific.
- LADY.** Two weeks before its parent, Concord, this fairly vigorous and prolific variety ripens its "white" berries, which are considered better than those of any other Concord seedling. Because of its lateness of bloom, its early ripening and its hardiness this is a good variety for short season localities.
- LINDLEY.** Best red of the Rogers' hybrids. Beautiful when well grown, yet the clusters are almost small, but the berries often large, rich and aromatic. Though ripening in mid-season they keep well. The vines are vigorous, hardy and prolific when cross fertilized; otherwise sterile.
- MOORE EARLY.** In effect a Concord variety two or three weeks earlier. The vines demand rich, well-drained, loose soil, frequent tillage and careful pruning. Clusters smaller, looser than Concord; berries larger and of not as good quality.
- NIAGARA.** Unjustly the leading American white Grape, mainly because over-advertised when introduced. Several other white varieties superior in quality. Vines vigorous, prolific, almost as hardy as Concord, its parent. Clusters large, berries "foxy" when first picked, milder a few days later. Poor keeper.
- ROMMEL.** An excellent white table variety suited to the South; not sturdy, hardy or productive enough in cold localities.
- SALEM.** Earliness, hardiness, vigor, fair prolificacy, high quality and long keeping combine to make this one of the best of Grapes. The large red berries on medium to large clusters ripen a little earlier than Concord, but keep until Midwinter or later.
- SCUPPERNONG.** Justly the leading family variety from Delaware to Texas. Yet the fruit to lovers of European and Northern varieties is too musky, even repulsive. The exceedingly vigorous vines are wonderfully prolific of late, uneven ripening little clusters of big greenish or brownish berries which drop as soon as mature.
- TRIUMPH.** One of the choicest of American dessert varieties; clusters medium to very large; berries medium to large, greenish to golden, juicy, tender, excellent, late (with Catawba) but not long keeping. In cold climates almost tender; often fails to ripen its fruit. Elsewhere adaptable to varied locations and warm, deep loams.
- VERGENNES.** A regular annual cropper. Vines very sprawling, not fully hardy in cold localities, prone to set too much fruit and therefore to delay ripening a week or two later than Concord instead of at the same time. Fruit red, of agreeable but not highest quality, long keeping—January or February.
- WILDER.** The most reliable of Rogers' black varieties though not of higher quality than several others. Vines vigorous, hardy, fairly prolific. Clusters medium size; berries large, good, ripening about with Concord; keeps fairly well.
- WINCHELL (Green Mountain).** A rare combination of earliness and excellent quality. Vines vigorous, hardy, healthy, prolific. Clusters

loose, rather small. Berries "white," small to medium, soft, sweet, excellent.

WORDEN. The best and most favorably known seedling of Concord, which it excels in its larger clusters of large berries, better quality and earliness—a week or ten days earlier. In hardiness, healthiness, vigor and prolificacy it equals its parent, but it is somewhat more particular as to soil.

HUCKLEBERRY AND BLUEBERRY

Attempts have been made to grow Huckleberries and Blueberries under garden conditions but have almost always been disappointing. The main reasons for failure have not been known until very recently. Through the investigations of Mr. F. V. Coville, Botanist of the Department of Agriculture, it has been proved that success in growing these and several other plants depends upon acidity of the soil and the presence of certain kinds of fungi or bacteria which perform a function akin to that of the various species of bacteria which aid Alfalfa, Clover, Beans and related plants to secure nitrogen from the air. This is perhaps the most important horticultural discovery of the century, since it indicates the kind of soil and situation in which success may be expected and just as clearly indicates where no attempts should be made to grow such plants.

Since home gardens rarely possess such conditions these fruits should be excluded unless the grower is willing to stand the expense of making conditions favorable. For full information on this crop the reader should secure publications of the Department of Agriculture.

JAPONICA

Few people know the Japonica Cydonia or Japan Quince as more than a beautiful, ornamental, hardy shrub which blazes with scarlet blossoms before the leaves appear. Some of these few value it for its hard, green, fragrant fruits which they place in closets and chests of drawers to impart perfume to clothes, a role which it plays until it shrivels to a mummy. But very few know that these fruits make a distinct and delicious conserve and jelly when treated the same way as ordinary Quinces. Unfortunately, for this purpose it is not very prolific, but where the bushes are used as a hedge enough should be obtainable to make a home supply.

The popular scarlet variety generally sets more fruit than the pink or the white kinds, so where jelly making is an object this one should be preferred for planting. Besides, it is the most beautiful. The shrubs thrive in almost all soils, but require sunny positions in order to bloom freely.

JUNEBERRY

The fruits of more than a score of *Amelanchier* species are called Juneberry, Maycherry, Shad-bush, Service-berry, Grape-pear, Sugar-pear and many other names—a sure indication of their popularity. As yet they are scarcely known in gardens except where the bushes or trees are planted primarily for their abundant, very early, white flowers. The dark red, purple or black fruit is a tiny Apple rather than a Berry, in some species no larger than Peas, in others, half to three-quarters of an inch. Usually fleshy, small seeded, sub-acid to sweet and very pleasant to eat *ad libitum*. Several so-called varieties of the dwarfs are offered by nurserymen, but among wild plants, especially in the mountains, are doubtless many just as good. As they are easy to transplant and readily adaptable to all soils not actually wet they are worth including in a family planting of fruits where space is available. When given care similar to that given Apples and Pears they will respond well. Birds and boys are their chief enemies.

Because of the great diversity among the fruits of wild plants this Juneberry offers excellent opportunity to the plant breeder for the origination of superior-fruited varieties. Since the seeds germinate readily it would seem that there are no special difficulties in the way. Grafting and budding should be as easy as with other plants of the Rose family—Apple, Pear, Peach, Cherry and Plum.

LOGANBERRY

Since 1881, when it originated, the Loganberry has become one of the leading fruits of the Pacific Coast, but in sections where Winter temperatures reach zero it is so tender that even when protected it often kills back badly or fails to produce satisfactory fruit. The purplish red fruit is perhaps the largest of all berries and when fully ripe is pleasantly acid, but while immature is intensely sour. It makes good “canned” fruit and “wonderful jelly.”

The plant succeeds in any well-drained soil, but seems to prefer those of a clayey nature to the sandy loams. Commercial plantations have continued profitable for fifteen years or more without renewal. New plants are secured from Fall-rooted cane tips which make best plants when one year old. These are usually set four to sixteen feet asunder in rows six to eight feet apart and given extra good care the first year. At close distances they are kept severely headed back; at great ones allowed to trail upon trellises. In a general way they may be handled like Raspberries and Blackberries.

I know of many attempts to grow the Loganberry in the North-



Fig. 105.—Champagne, one of the best Loquats

eastern quarter of the United States and adjacent Canada, but among them not one success. Doubtless, better results have followed similar trials in the Southeast, but I have not heard of them.

LOQUAT OR BIWA

The Loquat (Fig. 105), one of the most delicious of fruits, is popularly grown as a door-yard and garden fruit from Florida to California. While generally eaten fresh it is often made into preserves, jams, pies and jellies (the acid ones). The thin but tough skin

contains a firm to melting, juicy, cherry-like flesh and one to eight or ten large seeds in the center (Fig. 106).

So far the majority of the trees growing in the South are seedlings which, though mostly good, are inferior to the varieties recently originated by C. P. Taft of California, and to some of those imported from Algeria, Sicily and Japan, from which last country the Loquat comes originally. The trees, which often grow 25 feet tall, blossom in the Fall and in Spring ripen their globular to pear-shaped, yellow to orange fruits, which sometimes are three inches long.

While the tree will grow and produce an abundance of fruit on poor, dry soil, the specimens though of good flavor and quality, are almost always small. A moist, deep, gravelly loam suits them well. They will stand fairly liberal feeding, but unless the fruit is thinned the size will be more or less disappointing. In order to offset this the trees are sometimes set close together—12 to 15 feet apart, though about 20 feet is usual—and the fruit thinned considerably. Cultivation is the same as for other orchard fruits. Fertilizing may be fairly liberal after the plants begin to bear. Pruning consists in shaping the tree as other trees are trained and in removing inferior, internal and dying branches, preferably a little annually after the trees reach maturity. Since the flower buds are borne at the tips

of the current season's growths and at their bases bear buds which form a whorl of branchlets around the fruit, much time may be saved in thinning by cutting off these branchlets close to the limbs that bear them. Pruning is best done after the fruit is gathered. Among the choice varieties the following are considered best:

ADVANCE. Brilliant yellow, pear-shaped, often more than two inches long, borne in very large, dense clusters from mid-Spring to early Summer—about two months.

CHAMPAGNE. A very precocious bearer, oval to pear-shaped, large (2 or 3 inches), white-fleshed fruits in mid-Spring. Considered finest flavor of all.

VICTOR. Medium to large and showy, golden yellow, rather characterless flavor. Valued for canning. Season late Spring to Midsummer.

EARLY RED. Pear-shaped, deep orange, small to medium (1 to 2 inches). Earliest of all—Midwinter to mid-Spring, often more than three months.

PREMIER. Yellow to salmon-colored, oval, medium-sized fruits. Light colored, soft, juicy, sweet flesh. Season mid-Spring to early Summer—about two months.

Besides these varieties, California and Gulf States nurserymen offer several others—**THOLES** (or *Placantia* or *Gold Nugget*), **TANAKA**, **STATELY**, **GOLDEN MAMMOTH**, **PINEAPPLE**, **GRANT**, **BLUSH**, **COMMERCIAL** and **EULALIA**.

MULBERRY

As a paid-up annuity insurance policy against bird depredations the Mulberry richly deserves a place wherever Cherries and Raspberries are grown. Apart from this the fruits of some varieties are delicious to eat out of hand, or as dessert. They make good "juice" and wine and when mixed with acid fruits, such as Currant or Lemon, they are excellent canned or preserved. Add to this the ease with which they are gathered—merely jarring the trees to make the fruits fall into sheets spread below—and they have a special attraction especially for people who like to get something for nothing.

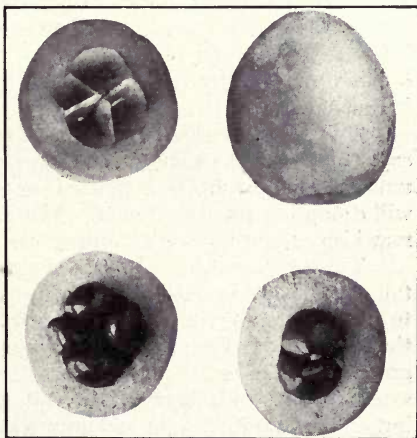


Fig. 106.—Tholes, a good Loquat

Should some readers dissent from my description of the edibility of the fruit, I shall not feel aggrieved, because they probably have sampled the Russian Mulberries—the whitish or blackish, sweetish, mawkish, sickish berries, gobbled by birds and boys who have not the hardihood or perhaps the opportunity to pilfer better fruit. No, the Russian varieties are decidedly inferior to the named varieties of different origin.

Of these the **NEW AMERICAN**, which originated in New York, is the best for the North, the **STUBBS** for the South. The former bears glossy, black, sub-acid berries, often one and one-half inches long, from June until September. The tree is not only vigorous and very productive, but hardy, at least as far north as Michigan. The **Stubbs**, a wonderfully prolific native of Georgia, averages larger fruits than **New American**, the black, rich, sub-acid berries often being two inches long and three-quarters of an inch in diameter. The **HICKS**, which hails from Kentucky, bears very good, medium-sized, sweet berries in abundance during three to four months. It is not so widely known as the previous two but is a very worthy rival. The **DOWNING** is unfortunate in several respects. It is not hardy in the Northern States. Too often some other variety is innocently or purposely substituted by the nurseryman for it. If the Northern grower is given **New American** instead he need not feel badly cheated, because true **Downing** might winter-kill, whereas **New American** is hardy. But no one likes to be cheated! **Downing** is best known south of **Mason and Dixon's** line where its large, black, sub-acid, very good berries are annually borne in profusion. The **JOHNSON**, an Ohio variety, is too shy a bearer to commend it for general planting, so it is being superseded by the others. Its sub-acid, black fruits are very large—often two by three-quarter inches. The tree though strong is irregular in habit.

TEAS' WEeping MULBERRY is of no value except to people who enjoy untrimmed poodles, Yorkshire terriers, Angora cats and other unkempt creatures. It is grafted on a straight stem so its branches will droop toward the ground. The fruit is small, reddish and as mawkish as that of its Russian parent.

The erect growing Mulberries are handsome trees, often 30 feet tall, ornamental in outline and foliage but not desirable to have close to the dwelling because their fallen fruit often makes a mess beneath them. A good place for them is where poultry have access to the ground so as to eat the fruit, which they will do very thoroughly and satisfactorily. Mulberry trees will grow in any well-drained soil but do best in rather light and gravelly ones. After being planted and started like other fruit trees they need little or no attention.

NECTARINE

The Nectarine is really a smooth-skinned Peach, though formerly botanists considered it a distinct species. Peach pits often produce trees which bear "Nectarines," and "Nectarine" pits return the compliment. Still more interesting is the fact that bud varieties are common on both trees; that is, a twig on a Peach tree may bear Nectarines, and one on a Nectarine tree Peaches. By graftage methods these twigs may be used for scions or buds to graft or "bud" on other trees and thus perpetuate the "bud sport."

Cultivation of Nectarines differs in no way from that of the Peach. The only notable point is that extra care must be taken to fight curculio, which seems to be specially partial to the fruit. (See Apricot for spraying method.)

Because little attention has been paid to it the Nectarine has developed few varieties. These are generally inferior to Peaches. Even in California, where it is grown commercially, it is used almost wholly for drying and canning, for which purpose it is of very secondary importance. If there is space for a few trees in the family orchard choice should be made among the following varieties:

DOWNTON. Early. Medium to large, pale green with violet red cheek, flesh greenish, reddish at the free pit, rich, melting and excellent.

HARDWICKE. Late Summer. Large, pale green, with violet cheek; flesh greenish-white, reddish at the free pit, juicy, melting, rich, high flavored.

BOSTON. Large, beautiful yellow with red cheek; flesh yellow to the small pointed freestone; sweet but not rich, and, being a native of the Hub, pleasant but peculiar.

EARLY NEWINGTON (Lucombe's Seedling or Early Black). Large, bright red with darker markings upon a pale green ground color. Flesh greenish white but deep red at the pit (cling), juicy, sugary, rich, excellent.

These are among the leaders in Europe and America. Besides them Thomas recommends **ELRUGE**, **EARLY VIOLET** and **NEW WHITE**.

PAPAW

A small native American tree whose attractive flowers—greenish at first but changing to purplish red—appear before the handsome foliage and whose large, oblong, dark brown, highly aromatic, creamy fleshed, soft, slightly gritty, very sweet fruits are relished when they ripen in the Fall. The tree is of doubtful hardiness north of New York City, though specimens are known to have thriven in Massachusetts. Two or three varieties have been offered by nurserymen.

If desired for fruit it is important to have both male and female trees as the species is dioecious and will not bear fruit unless the

pistillate blossoms are pollinated. Therefore, it is better to grow one's own seedlings, unless the nurseryman can guarantee the sex of each plant. This he can do if the plants have been propagated by any asexual method such as cuttings, budding or grafting, but not if grown from seeds unless the trees have produced fruits. By that time they will have become so large that transplanting will be risky and difficult. Better start with seeds, transplant the seedlings each year or root-prune them to make abundant fibrous roots and select the ones that bear fruits with one male tree to each four or five females.

PEACH

It is popularly believed that the Peach is a short lived, tender tree, subject to incurable diseases and relentless insects and that therefore investments in trees or orchards of this fruit are inferior to outlays in other directions. From the standpoint of the amateur and the family orchard this is highly regrettable. True, the tree, even with the best of care, rarely reaches the old age of the Sweet Cherry, the Apple or the Pear, but I know commercial orchards which have been productive and profitable for more than 25 years. Why may not the home orchard perform as well?

The fact that seedling trees are common in back yards and fence rows indicates that the Peach will thrive almost anywhere and that named varieties of superior excellence should be given preference, as they will doubtless give far greater satisfaction. Unquestionably the Peach, when of such varieties and well grown, is the most delicious tem-

perate climate fruit. Next to the Apple it has the widest variety of uses. Just look! Dessert, canning, preserving, jelly, syrup, wine, vinegar, butter, marmalade, pickles, short-cake, layer-cake, pie, cobbler, fritters, dumplings, meringue, sherbet, and, if you live in a wet State—well, don't you wish you had a tree for each of these purposes?

While trees of some varieties are too tender to be grown in the



coldest parts of the country, others have proved hardy even in Maine, Wisconsin and other cold Northern sections. To be sure, it may not be advisable to grow the fruit for even a local market, but we're not interested in that. It's the home we're aiming to supply. As a matter of fact, then, Peach trees are found in every State of the Union and in most of the Canadian Provinces.



Fig. 107.—Never "thumb" a Peach to see if it is ripe. Train the eye to recognize the exact stage of maturity

Few fruits equal and none surpass the Peach for the home plantation. It is easy to grow, quick to reach bearing age, highly, and almost annually prolific. Its varieties cover three or four months, are easily obtainable and are perhaps more likely to be true to name than are other tree fruits.

Where there is any choice the trees should be planted on light soil, on high or elevated land preferably sloping toward the north, northwest, or west, on which sides, if possible, the orchard should be protected from the prevailing winds. Sandy, gravelly and other coarse soils are better than heavy, silty or clayey ones, but where there's no choice the trees may be planted with confidence of good results. Well-drained the soil must be and the situation must not be in a pocket where cold air will settle, or the early opening flowers may be nipped by frost.

While the Pear and even the Apple may be grown in sod, the Peach never should be. The soil should be kept cleanly cultivated at least until Midsummer and then cover-cropped for the Winter, not too often with clover or other legumes because these tend to supply too much nitrogen and to make the trees tender. No danger need be expected from applications of potash or phosphoric acid. For young trees and those whose foliage is thin, small and yellowish, an ounce of nitrate of soda to the tree should help matters. A pound of each of muriate of potash and basic slag or half as much acid phosphate will be a good allowance in most cases. When the trees are in bearing the nitrate dose may be doubled; the others tripled. In

all-cases the material should be spread in a circular band two or three feet wide as far out on the ground as the branches extend. There's no need to spread any near the trunk as the feeding roots are not there. In all cases the fertilizer should be raked or harrowed into the surface.

The varieties to choose will depend first upon the section of the country. In the South are grown certain varieties not generally successful in the North. Among these are the Peen-to, Angel and Waldo of the flat Peach type; Honey or South China type, and Cobbler, Galveston, Lulu, Columbia, Texas and Victoria of the Spanish type. These it does not seem necessary to discuss below. Many of the



Fig. 108.—When trees are low-headed there's no trouble reaching every part without climbing. Compare this with high headed trees

varieties successful in the North are also popular in the South. Among them there are yellow-fleshed, white-fleshed and a few red-fleshed varieties, also some occasionally called "Melters" whose flesh parts readily from the pits, and so-called "pavies" whose flesh clings more or less tenaciously. There are gradations both in color and tenacity of flesh, some having more or less red near the pits, some being "semi-cling," a characteristic which is more pronounced in some seasons than in others. For convenience the varieties characterized on the following page are thus classified. Usually the clingstone varieties are better for culinary uses than for dessert.

CLINGSTONE VARIETIES

RED FLESHED

BLOOD CLING. A very late small to medium, red-skinned, red-fleshed variety of special excellence for culinary purposes but good also as a fresh fruit.

WHITE FLESHED

HEATH CLING. Oldest American variety still grown. Remarkably hardy and healthy. Very late; fruit may be kept till Christmas! Quality often below moderate, but when well grown may be sweet and even rich. Flesh adheres tenaciously to the stone, hence not valued for dessert. Noted for preserving and especially for pickling.

OLDMIXON CLING. A favorite for a century and a half, still a leader in high quality—rich, luscious, dessert and culinary, white fleshed, late. Trees vigorous, hardy, healthy, but not remarkably prolific.

WADDELL. A white-fleshed, semi-clingstone variety somewhat earlier and better than Carman. Tree vigorous, hardy, prolific.

YELLOW FLESHED

ARP. The best early yellow variety. Medium sized, blushed, creamy-yellow, with firm light yellow, sweet, rich, rather clingstone flesh of excellent quality. Begins to ripen four to five weeks before Elberta. Trees healthy, sturdy, hardy, prolific.

LEMON CLING. A large yellow, lemon-like, firm-fleshed, juicy, mid-season variety, popular for canning in California. Tree vigorous, prolific and regular bearing.

SEMI-CLING VARIETIES

WHITE

GREENSBORO. Among early white-fleshed varieties, one of the leaders because of its large, showy, creamy-white, blushed, juicy, fair-quality fruits, and its large, sturdy, healthy, precocious and prolific trees do well on a wide range of soils.

IRON MOUNTAIN. Very late, large, white-fleshed, not attractive looking enough for dessert, but excellent, especially for culinary purposes. Flesh white, brown centered, juicy, tender, sweet, semi-freestone. Tree hardy, vigorous but not always productive.

LOLA. A popular, Southern, white-fleshed variety, which follows and is of superior flavor to Greensboro; superior also to Champion, which it precedes. Same season as Carman. Very juicy, melting, sweet, semi-free. Tree vigorous, productive, hardier than Carman.

FREESTONE VARIETIES

WHITE FLESHED

BELLE (of Georgia). One of the most beautiful, creamy-white, crimson-cheeked fruits, with daintily marked white flesh of good but not best quality; somewhat inferior to Champion. Early mid-season. Tree, rather straggly, hardy and productive.

CARMAN. A handsome, creamy-white, brilliant red-cheeked, but rather poor-flavored, early variety of medium size. Tree remarkably adaptable to diverse soils.

CHAMPION. Choice white Peach but prone to be small in unfavorable soils. A mid-season, medium to large, greenish to creamy-white blushed fruit with white, very juicy, tender, sweet flesh. Semi-free to freestone.

HILEY. An early, mid-season, white-fleshed, freestone variety of quality superior to others of its season. Large and handsome when well grown but variable. Trees not very hardy. Flesh creamy white, red-centered, good quality.

IMPERIAL. One of the best of honey-flavored Peaches—popular in the South. A large, late, greenish, blushed, white-fleshed, red-centered fruit. Melting, tender, very sweet, well flavored, excellent. Tree productive, rather tender Northward, prolific but drops fruit rather badly.

KALAMAZOO. A high-quality dessert and culinary, yellow-fleshed, freestone variety, which ripens with and is more prolific than Late Crawford. Trees vigorous but susceptible to leaf curl.

MOUNTAIN ROSE. One of the choicest early mid-season, white-fleshed, freestone varieties, but not very prolific. Fruit medium to large, deep blushed, creamy white. Flesh red-centered, juicy, melting, sweet, excellent.

OLDMIXON FREE. Similar to Oldmixon Cling, but freestone, more sprightly flavored but not of quite such high quality. Tree hardy, vigorous, not highly prolific.

RIVERS. A high quality, rich, sugary, early but medium to large-fruited, white-fleshed, European, freestone variety. Trees vigorous, hardy, prolific.

STEVENS. A large, white-fleshed, late, freestone, of extra fine quality, and as beautiful as excellent. One of the best for the family orchard.

STUMP. An unattractive looking but old favorite, white-fleshed, late freestone of the Oldmixon class. Its flesh is melting, juicy, and rich unless over ripe, when it is almost poor. Trees vigorous, hardy, healthy, prolific.

TRIANA. A small honey-fleshed, deliciously flavored Southern variety, which, however, has been grown experimentally in western New York.

YELLOW FLESHED

BERENICE. Variable, but when well grown one of the choicest. A mid-season, medium-sized variety, greenish yellow with red-blush cheek, yellow, melting-sweet flesh. Tree healthy, hardy and moderately prolific.

CAPTAIN EDE. A mid-season, medium-sized, yellow-blushed fruit with yellow, dry, rather meaty, highly fragrant flesh of good quality. Tree vigorous, hardy, generally productive.

CHAIRS. One of the choicest and long time-favorite varieties. Fruit mid-season to late, medium to large, golden yellow with dull red blush and yellow, juicy, sub-acid, excellent flesh. Tree vigorous, hardy, not highly productive.

CROSBY. A splendid late dessert and culinary variety, medium sized, orange yellow largely blushed. Flesh yellow, red-centered, juicy, firm, but tender, sweet, of delicious quality. Tree somewhat small, remarkably hardy, vigorous, healthy and prolific, but not very adaptable to diverse soils.

EARLY CRAWFORD. (Fig. 109). Without a peer in its mid-early season and scarcely at any other time. Fruit very large, golden yellow, deep red blushed; flesh yellow, red veined, juicy, tender, high flavored, excellent, freestone. Tree healthy, vigorous, large but slow, uncertain and shy bearing.

EDGEMONT. A slightly more acid, somewhat later and more productive variety than Late Crawford which it otherwise closely resembles. Its season is a little later than Elberta, compared with which it is more juicy, less stringy, somewhat smaller but far superior in quality. Fruit large, light to orange yellow, bronze flushed, yellow fleshed, red-centered, very juicy, meaty, mild, sub-acid, excellent freestone.



Fig. 109.—Early Crawford, one of the choicest of Peaches

ELBERTA. The most cosmopolitan of American Peaches because of its productivity, size, adaptability to soils and climates. But its poor quality should lead to the choice of finer varieties for the family orchard. As frequently marketed, it is almost inedible to people familiar with good Peaches.

FITZGERALD. Resembles Early Crawford, but is generally a few days earlier, more prolific, hardier.

GOLD DROP. A medium-sized late Peach remarkable for its clear golden, dull blushed skin, pale yellow, generally juicy, sprightly, freestone flesh and its healthiness, precocity and hardness of tree. It tends to overbear, so thinning is necessary.

LAMONT. Resembles Early Crawford in appearance and quality but more prolific and later. A yellow-fleshed freestone. Excellent as a home variety. Fruit medium to large, yellow, blushed, flesh red-centered, juicy, sprightly.

LATE CRAWFORD. The highest quality yellow Peach. Fruit late, very large, deep yellow with large dull cheek, flesh yellow, red-centered, firm, tender, juicy, rich, excellent, freestone. Tree vigorous, readily adaptable to diverse soils, but slow maturing and shy bearing.

LEMON FREE. Makes specially attractive looking canned Peaches, hence its California popularity. A yellow, late mid-season variety of un-

attractive appearance, very good quality but rather too dry flesh for dessert. Tree large, hardy, rather shy bearing.

NIAGARA. A yellow freestone variety which resembles Early Crawford but is larger, later, borne more abundantly. The tree is also more adaptable and dependable.

REEVES. Old favorite, high-quality, yellow-fleshed freestone. Fruit mid-season, medium size, yellow, red cheeked; flesh yellow, red-centered, juicy, melting, sweet, excellent, freestone. Tree vigorous, hardy, only fairly prolific.

ST. JOHN. An early yellow freestone dessert variety of the highest rank. Fruit handsome, rich, sweet, excellent. Several days earlier than Early Crawford, which it resembles. Tree vigorous, hardy but uncertain of cropping.

SALWEY. One of the latest varieties, a yellow-fleshed freestone of good but not best quality for dessert but excellent for canning, evaporating and preserving. Often too late for Northern and cold sections. Tree vigorous, hardy, healthy and highly prolific. This European variety is probably the most widely grown of all in the world.

WAGER. A rather small, yellow-fleshed freestone, mid-season variety of only moderate dessert quality but excellent for culinary uses. Its hardiness, prolificacy and early bearing are remarkable.

PEAR

While the Cherry and the Peach have each special claims to attention from home fruit growers the Pear has equal, if not superior, rights. It is every whit as splendid a fruit and its varieties cover a far longer season than either of the others. Yet how many of the present or the rising generation know more varieties than Bartlett and Kieffer, the one mediocre, the other decidedly inferior? To the superabundance of these two, especially the latter, is largely due this ignorance.

Many Pear varieties are suitable for culinary purposes and not fit for anything else, yet there are several of such superlative excellence that they deserve to rank with the choicest fruits of the world. Some of the leading ones of these are described on succeeding pages.

The Pear succeeds almost everywhere that the Apple will grow. While it thrives in a considerable variety of soils, it does best in the heavy clays and clay loams. When planted in sandy and other light soils it is usually short lived, perhaps because it there grows too rapidly to resist the blight. For this reason also the trees seem to do best when growing in sod, which tends to check growth partly by using up nitrogenous plant food and water. Stable manure and other nitrogen-supplying plant food must be given very sparingly because they induce woody growth.

In handling the trees the same methods as those used for the Apple may be used, as the habits of the trees are similar. Pear picking,

however, demands more care and good judgment, for unlike most other fruits Pears should be picked before getting ripe enough to be eaten. The best rule is to wait until they are full size and have begun to show the colors of maturity but not until they have begun to get soft. With early varieties this may be a week before the fruit would ripen on the tree; with Autumn kinds two to three weeks, with Winter



Fig. 110.—Could anyone ask for a more liberal setting of fruit?

sorts from a month to three months before the fruit would ripen indoors. (See storage, page 93). Each fruit should then be lifted upwards and outwards so that it will separate where the fruit stem is attached to the twig or fruit-spur. If ripe enough the fruits will part readily without breaking either the stalk or the twig. As soon

as picked they should be placed in a chest of drawers, a closed closet, spread upon shelves and covered with paper, or wrapped in paper and placed in boxes—any way to keep them out of a current of air.

Many Pear varieties are specially successful when grown as standard dwarfs upon Quince roots. Some do better, others as well one way as the other, some fail unless “double worked.” This process consists in first grafting an amenable kind on the Quince, then grafting this over to the desired variety. Among the varieties of each class are the following:

Varieties better as dwarf than as standard trees: Angoulême, Diel, Easter, Glout Morceau, Louise Bonne and Vicar. Varieties equally good on Pear or Quince stocks: Barry, Josephine, Winter Nelis, Gris d'Hiver, Danas, Hovey and Easter Beurré. Varieties better on Pear than on Quince stocks are: Bartlett, Gray Doyenne, Lucrative, Onondaga, Seckel. Varieties that generally fail on Quince unless double-worked: Bosc, Sheldon, Winter Nelis. Before deciding on any of the first two groups, I would choose the varieties I discussed in the *Garden Magazine* as follows:

“The Comice Pear, in my opinion, deserves more general planting, especially for home use. Of all the high-quality Pears I should place it second only to Seckel, though Sheldon pushes it rather hard for this high place. It is certainly finer flavored than any specimen of Bosc, Anjou, or Clapp that I have ever eaten. In size the best specimens I have sampled equal Angoulême, which they surpass in texture as well as flavor. In juiciness it is the equal of Louise Bonne de Jersey, which it surpasses in having a far less astringent, tough, gritty skin. As to its sweetness, it is a close rival of Flemish Beauty. For a Pear to form one of a succession it would cap the climax of this list: Clapp, Flemish, Seckel, Sheldon, Comice, thus covering the season from mid-September to late November—provided the family appetite would let it last that long.”

Most of the early Pears are undesirable because their quality is inferior to that of later ones, or they decay at the core before showing any symptoms on the surface. But since the earliest begin to mature nearly two months earlier than the Bartlett, it may be well to include not more than one tree each of Madeleine, Manning's Elizabeth, Tyson, Rostiezer, Clapp and Giffard. Unless there is plenty of space I would omit Bartlett because it is not of as high quality as later ones and it is always obtainable in the market. I would rather devote the area to Onondaga, Hardy, Howell, Vermont Beauty, Lawrence, Easter Beurré, Anjou, Boussock, Buffum, Madeleine, Malines, Rostiezer, Superfine, Tyson and White Doyenne.

PEAR VARIETIES TO COVER THE WHOLE SEASON

MID TO LATE SUMMER

BARTLETT. The leading commercial variety. Medium to large, clear yellow often blushed fruit. Flesh white, fine grained, tender, either almost sweet or slightly sub-acid, moderately flavored. Late Summer and early Autumn. Tree erect, vigorous, precocious, very productive. One of the best early Pears for canning. When well-grown, gathered promptly and ripened in the house passable for dessert. Not comparable to later Pears in quality but valuable for the family orchard.

CLAPP (Clapp's Favorite). Large, yellowish-green to yellow with dark-red cheek. Flesh greenish or yellowish-white, delicious, perfumed, juicy and melting, but unless gathered rather early, ripened carefully and eaten promptly, prone to decay at the core and be useless except as a missile. Precedes Bartlett. One of the best early general purpose Pears.

MADELEINE. Medium, pale yellowish-green, faintly blushed. Flesh juicy, melting, slightly acid, delicate, pleasant. Ripens best indoors about Midsummer.

MANNING'S ELIZABETH. Small, yellow, blushed. Flesh very melting, sweet, sprightly, fragrant, excellent. Late Summer. One of the best earlies. Does best as a dwarf.

ROSTIEZER. Small to medium, brownish-green with dark reddish-brown cheek. Flesh juicy, sweet, melting, highly perfumed, excellent—considered best of early Pears. Season late Summer.

TYSON. Small to medium, bright-yellow with reddish-brown cheek often russeted. Flesh fine, buttery, juicy, melting, almost sweet, faintly perfumed. One of the best early varieties. Late Summer. Tree slow to reach maturity and often a rather shy bearer.

EARLY FALL

BELLE LUCRATIVE. Medium, yellowish-green, somewhat russeted. When well-grown and properly ripened the flesh is very juicy, sweet, fine textured, melting, rich, perfumed, excellent; scarcely excelled even by Seckel. Sometimes poor, often rots at core. Season early Fall.

BOUSSOCK. Large, yellow, somewhat russeted, sometimes red-cheeked. Flesh very juicy, melting, buttery, good flavor. Early Fall. A reliable and valuable variety.

FLEMISH BEAUTY. Large, pale yellow, mostly russeted. Flesh very juicy and sweet. Melting, often very rich, excellent when well-grown and house-ripened. One of the choicest, but it must be sprayed thoroughly or scab may make the fruit worthless. Season early Fall—follows Bartlett.

SECKEL. The standard of excellence. Should be first choice for family orchard. Small, brownish-green to yellowish-brown, often red-cheeked. Flesh very fine textured, sweet, buttery, melting. Richest flavored of Fall Pears. Tree slow grower, very hardy, notably free from blight. Will stand higher cultivation than many other varieties. Early to late Fall. Dangerous to take to school because too tempting to keep in the desk.

VERMONT BEAUTY. Medium, yellow, handsomely red-cheeked. Flesh very juicy, melting, very sweet, rich, fragrant, excellent. Early to mid-Fall. Fruit remarkably clean but of variable size.

MID-FALL

ANGOULÊME (Duchess). Greenish-yellow, often russeted. Flesh yellowish-white, melting, buttery, juicy, good when well-grown but often inedible and fit only for spicing and pickling when fruits weigh less than one-quarter pound. Mid-Fall. Best as a dwarf. Good specimens are too large for a boy's pocket but not his "bread-basket."

ANJOU. Medium to large with dull red, often russeted cheek. Flesh yellowish-white, fine-grained, buttery, melting, rich. Tree variable as a cropper. Where it succeeds Anjou is one of the best of all Pears because of its hardness, uniformity and long keeping quality. Season mid-Fall to Midwinter—if the supply can withstand family attacks.

BOSC. Large, deep-yellow, mostly russeted. Flesh juicy, buttery, rich, fragrant, sweet, excellent. Tree a straggly grower. Fails as a dwarf unless double-worked. Season mid-Autumn. One of the best.

COMICE. Large, greenish-yellow, often faintly blushed and more or less russeted. Flesh white, fine, very juicy, melting, sweet, rich, rather aromatic. An excellent keeper during mid to late Autumn. One of the choicest when ripe. Not safe to put in a boy's pocket because it will easily "squash."

GRAY DOYENNE. Medium russet. Flesh melting, perfumed, rich, excellent. Mid-Fall to Winter—if enough to last! Must be thoroughly sprayed to prevent scab on the fruit.

HARDY. (Fig. 110). Large, greenish, russeted. Flesh buttery, rather melting, rich, somewhat sub-acid. Good in mid-Fall. Does well on Quince.

LOUISE BONNE. Medium to large, yellowish-green, brown-red cheek. Skin gritty and acid. Flesh yellowish-white, very juicy, buttery, melting, slightly sub-acid, rich. Tree remarkably productive, an almost annual cropper. Does best as dwarf. While hardly of best quality this variety is so sure a bearer and the fruit is so firm that it should be in every family orchard to succeed the Bartlett. Season early to mid-Fall.

ONONDAGA. Greenish to rich yellow with sometimes a brownish cheek. Flesh a little coarse grained but buttery, melting, juicy, rich and fine. While not of highest quality this is an excellent family Pear for baking and canning. Season mid-Autumn. A good annual cropper. Few boys can eat more than two at a sitting, they're so large and juicy.

SHELDON. Medium to large, greenish russet to brown. Flesh slightly coarse-grained, but very juicy, melting, winey, excellent. Tree vigorous as a standard but fails as a dwarf unless double-worked. Mid-Fall. Hard to keep in a schoolboy's desk.

WHITE DOYENNE (Virgalieu of New York). Medium to fairly large. Pale yellow often blushed. Flesh white, buttery, melting, very fine textured; rich, excellent. Mid to late Fall or even later. Unless well sprayed the fruit is sure to scab and in many cases be worthless.

LATE FALL TO MIDWINTER

BARRY. Large, orange yellow, russeted. Flesh juicy, buttery, rich, excellent. Tree a poor grower, fails as a dwarf unless double-worked. A leading late Winter variety, especially in California.

DANA'S HONEY. Small, yellow, somewhat russeted. Flesh buttery, melting, excellent. Season early Winter.

- EASTER BEURRE.** Large, yellowish green, somewhat russeted. Flesh juicy, fine-grained, melting, very buttery, excellent when well-grown and properly ripened. Does not mature well in Northern States and Canada. Mid to late Winter. Does best as a dwarf.
- GRIS d'HIVER.** Medium, greenish, russeted. Flesh greenish, very juicy, melting, buttery, rich, sub-acid. Early Winter.
- HOWELL.** Medium to large, light yellow often handsomely cheeked. Flesh white; melting, buttery, rather rich, aromatic, inclined to be variable. Tree sturdy grower and producer of very clean fruit. Season mid to late Fall.
- JOSEPHINE DE MALINES.** Medium, yellowish; flesh pale salmon towards core, sweet, buttery, distinctive flavor. Tree best as a dwarf. Early to Midwinter or later.
- LAWRENCE.** Medium, lemon yellow. Flesh whitish, aromatic, rich, very good. Late Fall and early Winter. Tree a moderate grower, rather spreading, precocious, good cropper. Fruit best early Winter variety. Easy to ripen.
- VICAR OF WINKFIELD.** Large, pale yellow, or yellowish-green, sometimes with dull, red cheek; flesh greenish or yellowish-white, buttery, juicy, fair flavor, though sometimes rather astringent. Late Fall to Midwinter. Tree a straggly grower. Does well as dwarf. Very productive. The fruit is specially valuable for cooking, almost never for dessert.
- WINTER NELIS.** Small to medium, yellowish-green, russeted. Flesh yellowish-white, fine-grained, very melting, buttery, rich, sweet, rather winey, fragrant, excellent. Early Winter. Tree slender, straggly.

PERSIMMON

According to tradition there was once a young lady who sought to reduce the size of her mouth by frequently repeating the words "prunes and prisms," because these are such "puckery" words. If she had accepted popular belief, however, she could have enjoyed a far more puckery sensation by eating, or attempting to eat, immature Persimmons.

While it is a fact that Persimmons are astringent when unripe, it is neither true that all must be frost-bitten to destroy this quality and make them edible nor that frost is always effective in this respect. There are varieties that ripen weeks or even months before the arrival of the earliest frost and are bland and pleasant as soon as ripe; and there are others which even after being frozen solid several times continue to be "awful drawy."

Two classes of Persimmons are grown in the United States—American and Japanese. The former, which includes few cultivated varieties as yet, is common as a fence row tree in the Southeastern States, and extends its range as far north as Connecticut and westward to Kansas; the latter, varieties of which are planted for home and market, is more tender, being doubtfully hardy north of Kentucky.

Though the native species in the forest often reaches a height of 75 feet, in the fence rows it rarely exceeds 30 feet. In the home orchard,

therefore, it need not grow as tall as an Apple tree. As it is a particularly difficult tree to transplant, and as seedlings produce very variable fruit, the best way to get good varieties is to gather seeds in Autumn or early Winter, keep them in sand or soil out-of-doors until Spring, then plant where the trees are to grow, the idea being to bud or graft them the second or third Spring thereafter with varieties of known merit. When the bark will separate freely from the wood is the proper time. Ordinary methods of budding and grafting are successful.

If it is ever necessary to transplant the trees the operation should be done as soon as the leaves drop in the Fall of the first or the second year, so as to save as much as possible of the tap root. The top must be cut back severely to balance the loss of this main root, otherwise the tree will almost surely die. Any warm, deep, well-drained, well-prepared soil will suit this tree, especially if placed in full sunlight and kept clean cultivated for the first several years. When transplanted the trees should be set two or three inches deeper than in the nursery, and 15 to 20 feet apart. The branches should be started low to favor hand-picking. As the trees are very deep rooting, other plants may be set near them, and as they are exceptionally free from insects and diseases they are never a menace to other fruit trees or bushes.

Among the varieties so far disseminated the ones shown in the accompanying table are described by W. F. Fletcher in Farmers' Bulletin No. 685, which may be secured upon application to the Department of Agriculture. The "season" for any locality may be calculated from that given in the table by remembering that north of the place of origin it will be later, but south earlier.

AMERICAN PERSIMMON VARIETIES

Name	Origin	Season	Size	Color	Seeds	Flavor & Quality
Boone.....	Ind...	Oct. & Nov.....	Medium.....	Yellow blushed.	Many...	Sweet but not rich, good
Burrier.....	Ky...	Rather early...	Medium.....	Yellow.....	Very few	Soft, very good
Delmas.....	Miss...	Oct. & early Nov.	Med. to large	Reddish yellow.	Many...	Sweet, rich, good
Early Bearing.....	Ind...	Oct.....	Medium.....	Dull yellow.....	Few....	Very good
Early Golden.....	Ill...	Sept.....	Med. to large	Yellow.....	Few....	Sweet, very good
Golden Gem.....	Ind...	Aug. to Oct.....	Med. to large	Dark orange....	Few....	Rich, sweet, good
Hicks.....	Ind...	Oct.....	Med. to large	Dark red.....	Few....	Rich, very good
Josephine (Am. Honey)	Mo...	Sept.....	Medium.....	Bright yellow to translucent...	Few....	Sweet, rich, good
Kansas.....	Mo...	Sept.....	Rather large	Yellow, red splashed.....	Rich, very good
Marion.....	Mo...	Oct.....	Large.....	Dull red.....	Few....	Good though not very rich
Miller.....	Mo...	Sept.....	Large.....	Reddish yellow.	Many...	Sweet, good
Ruby (Little's Ruby)...	Ind...	Sept. and later..	Small to med.	Yellowish red to deep red....	Few....	Sweet, very good
Shoto.....	Ind...	Oct.....	Large.....	Dull yellow blushed.....	Few....	Very good
Smeech.....	Pa...	Oct. & Nov.....	Medium.....	Dull yellow splashed red..	Rich, sweet, very good

The Japanese Persimmon or Kaki may be grown in the same way as the American species, except that being more tender it will not succeed in regions where the Winter temperature is very low. It is grown successfully in eastern Virginia and even as far north as Newark, N. J., but these cases are exceptional. The Kaki is decidedly a Cotton-belt fruit, but bids fair to give rise to hardier seedlings suitable for colder sections.

Until recently an objection to many of the varieties is the dropping of the fruit. This is now understood to be due to imperfect, or no pollination, and has been effectually remedied by planting other varieties nearby. The Gailey, a variety highly prolific of pollen, is recommended for this purpose at the rate of one tree to each six or eight of other varieties. On the other hand, the Tane-Nashi is a self-fertile kind that may be planted alone.

Another peculiarity of the Kaki is that fruits of the same variety and sometimes on the same tree, show variations in color, shape and size. Much of this variation is removable by good pollination. So far as studied the seedless varieties have light-colored flesh. Often, however, when part of the fruit is seedless and the other part bearing seeds there will be sections of light and dark-colored flesh which correspond with the absence or presence of seeds! From the home standpoint this is of far less moment than from that of the market. The dark flesh is always pleasantly flavored, whereas the light flesh is usually puckery until it becomes soft.

Among varieties more or less cultivated in America the following are perhaps best known;

COSTATA, medium-sized, salmon-yellow, few seeded, long keeping, fine flavored. FUYAGAKI, medium-sized, orange-red, sweet, fine flavor, excellent. HACHIYA, very large, showy, bright red, spotted, very fine, not very prolific. HYAKUME, large to very large, buff-yellow, sweet, meaty, fine, prolific. TABER No. 23, medium, rather dark red, dotted, sweet, seedy, good. TABER No. 129, medium, dark yellowish-red, crisp, meaty, sweet, excellent, good keeper. TAHOPAN, large, (often weighing a pound,) bright orange-red, seedless, excellent. TANE-NASHI, large to very large, light yellow, changing to bright red when fully mature, high quality. TRIUMPH, medium, yellow, few seeded, highly prolific, excellent quality. TSURA, large, bright red, few seeded, good when fully ripe. YEDDO-ICHI, large, dark red, with heavy bloom, flesh very dark brown or purplish, crisp, sweet, rich, edible while still hard. GEMON (Among), large, light yellow, changing to dull red mottled orange, few seeded or seedless, flesh high quality. ZENGI, small, yellowish-red, seedy, very early, quality good, highly prolific.

PLUM SPECIES AND VARIETIES

While more than a score of Plum species are described by botanists, the most important of the several thousand varieties recognized by

pomologists are descended from two European and one Japanese species. Within the past half century efforts have been made to develop useful varieties from several American species, not that these species, or the varieties as yet developed from them, are superior to those of the European or Japanese species, but they are needed either to fill gaps in our season, or to supply Plums where these Old World varieties and their descendants fail because of unfavorable climate.

The European varieties succeed best from Nova Scotia southward to Pennsylvania and westward to Michigan, in the irrigated sections of the Rockies and also on the Pacific Coast. In favored localities of the Southeastern States are occasional orchards even to the Gulf of Mexico, but in the Mississippi basin they are almost unknown. The Japanese varieties as a class are less desirable than the European, but they enhance the list of flavors, extend the Plum season and they may be grown successfully in many sections where the Europeans fail or are only indifferently successful, notably in the South and the Southwest as well as in sections where the Europeans succeed. Except a few varieties, characterized herein, choice should be first made among the European varieties where these succeed.

Both European and Japanese Plums have been cultivated and improved for centuries. So it is not surprising that they have numerous varieties. American species began to attract pomological attention scarcely more than fifty years ago, yet varieties have been originated which are not only good in themselves but give promise of much better ones to follow. The leading American species (*Prunus americana*) grows wild from Nova Scotia to Florida and westward to the Rockies—a pretty big territory! While perhaps none of its varieties, which are practically all early ripening, equals in quality even the mediocre European or Japanese kinds and may therefore be excluded from the home orchard where these will thrive, yet they form a highly welcome addition to the meagre fruit list where the more civilized, more pampered foreigners lack stamina. A sub-variety (*P. americana mollis*) is specially abundant in Iowa and Missouri. Its leading variety is Wolf.

Another (*P. hortulana*) native from western Tennessee and Kentucky to Illinois, Missouri and Kansas, Oklahoma and Arkansas, is valuable because its varieties are specially suited to the lower Mississippi basin and the Southern States. They bear well at least as far north as the Lake Erie shores. Varieties of a sub-species (*P. hortulana mineri*), possibly a hybrid between *hortulana* and *americana*, are specially valuable because they ripen late and thus extend the season where only native Plums can be grown successfully.

The Canada Plum (*P. nigra*), considered by some botanists and

pomologists as merely a botanical variety of *americana* being a native from Newfoundland to northern Ontario and southern Manitoba and to the tops of the mountains as far South as the Carolinas and Tennessee, is specially valuable in cold sections where other Plums, even the other American species, fail. They are noted for hardiness of wood and buds, toughness and pliability of branches which withstand wind and snow, and earliness of fruiting, hence certainty of ripening even in short seasons.

Still another species (*P. munsoniana*) common from central Tennessee to northern Texas, has produced varieties of probably more importance than any other natives for the South. Some of them are also valuable even as far North as southern Michigan. Though nearly all are clingstone some are valuable for dessert and many for cooking.

AMERICAN GROUP

(Species names in parentheses refer to preceding general discussion of the American Plums.)

CHENEY (*P. nigra*). Valuable only in coldest sections where better varieties are tender. The medium-sized, reddish, clingstone fruits are mid-season and ripen during a long period. Only moderate quality.

DE SOTO (*P. americana*). One of the best American Plums because of fair tree growth, prolificacy, hardiness and moderate quality freestone fruit.

FOREST GARDEN (*P. hortulana mineri*). Widely disseminated in the Middle West. A late red, medium-sized, spicy-flavored, clingstone variety, scarcely of dessert quality but excellent for preserving. Tree sturdy, hardy, precocious and of variable prolificacy.

HAWKEYE (*P. americana*). A satisfactory clingstone, mid-season variety for eating raw or cooked, but very susceptible to brown rot. Trees hardy, prolific, very straggling.

MAQUOKETA (*P. hortulana mineri*). One of the best American culinary Plums. Trees hardy even in Minnesota. Fruits late, short season, small, red, rather strong flavored, clingstone.

MILTON (*P. munsoniana*). A large, early, short season, dark red variety, rather free from rot. The yellowish, very juicy flesh, clings firmly to the stone. Trees medium size, hardy, healthy, prolific.

MINER (*P. hortulana mineri*). A standard in its group and widely distributed, especially in the northern limits of Plum growing. Trees sturdy, healthy and prolific. Fruit rather late, medium size, dull red with pale yellow juice, flesh of good quality, especially for culinary purposes, clingstone. Must be cross-fertilized or will not bear.

ROLLINGSTONE (*P. americana*). A medium-sized, rather dull red, mid-season, culinary, almost freestone variety, with short period of ripening. Tree rather dwarf, crooked, unkempt.

STODDARD (*P. americana*). A mid-season, medium-sized, red, clingstone variety, with dark yellow, juicy flesh, sweet near the skin and tart at the cling pit. Tree large, sturdy and prolific.

WAYLAND (*P. hortulana*). Valuable in the dry Southwest, because the trees bear heavily but late. Fruits small, red, sour, clingstone, excellent for culinary purposes. Trees large, sturdy and hardy.

WILD GOOSE (*P. munsoniana*). A very early, handsome, medium-sized, red variety, with tender, melting, pleasant flavored, clingstone flesh. Tree large, healthy, hardy and prolific when well pollinated, sterile, or nearly so, otherwise.

WOLF (*P. americana mollis*). A remarkably hardy, reliable American variety which bears handsome, medium-sized, red fruits of good flavor, almost freestone. Valuable in the upper Mississippi Valley, but probably not elsewhere, unless in very cold sections where better Plums fail.

WYANT (*P. americana*). One of the best American varieties. Tree small, spreading, straggly, hardy, healthy, prolific. Fruit mid-season and with short period of ripening. Medium-sized, dark red, flesh yellow, juicy, tender, melting, sweet, of fair quality and nearly free from the pit.

EUROPEAN GROUP

AGEN. Particularly valuable for prune making because of its richness in sugar and solids and its regular annual bearing. Good also for dessert. Fruit below medium in size, late, reddish-purple, almost freestone.

BAVAY. See Reine Claude.

DAMSON. Impossible to eat raw. Noted for twenty centuries for jam. A little, late, astringent, blue Plum, borne profusely on small trees. Widely adaptable to soils and climates, hence superior to several of its progeny which excel it in other respects.

FRENCH. The largest and best quality variety of the Damson group. Sometimes the stone clings to the flesh, sometimes it is free. Fruits purple, late, follows Shropshire. Trees large, strong, prolific annual croppers.

GOLDEN DROP. The largest and handsomest yellow variety, suitable for dessert, culinary purposes and drying. Very late, freestone. Particularly successful on the Pacific coast; almost a failure in the East because the trees are tender to frost and susceptible to disease.

GREEN GAGE. See Reine Claude.

HAND. See Reine Claude.

IMPERIAL GAGE. See Reine Claude.

ITALIAN PRUNE. A late, short season, purple, freestone Plum, specially useful for culinary purposes. Its good qualities have made it one of the most widely grown varieties of the world.

JEFFERSON. See Reine Claude.

LAWRENCE. See Reine Claude.

MCLAUGHLIN. See Reine Claude.

MIDDLEBURG. A large, late, purple, almost freestone variety, of long season and excellent quality for dessert and culinary uses. Trees medium size, sturdy, hardy, healthy and prolific.

MONARCH. One of the largest, handsomest and best flavored of purple Plums. Fruit late, clingstone. Tree medium size, prolific.

PACIFIC. One of the most beautiful, largest and best flavored of purple freestone Plums. Trees sturdy, hardy, prolific. Fruit mid-season, ripens during long period. Favorably known in Oregon and Washington. Not fully tested in the East.

PEARL. See Reine Claude.

PETERS. See Reine Claude.

PURPLE GAGE. See Reine Claude.

REINE CLAUDE. For over two centuries the standard of high dessert quality because of its richness, texture, juiciness and aroma. As ordinarily handled and unthinned, it is not remarkably attractive in appearance, but when well grown on healthy trees and thinned, it is a handsome, yellowish-green Plum. Fruit mid-season, large. Tree small, subject to sun scald, very prolific, an annual cropper, rather short-lived.

Reine Claude has a numerous progeny differing in season, period of ripening, size, prolificacy, etc. The ones discussed below have the characteristic high quality of the parent. All except Purple Gage are greenish-yellow, though some of them, notably McLaughlin and Yellow Gage, often have blushed cheeks in the sun. The following comments on individual members of the group will help in making a selection of varieties:

BAVAY. Tree medium size and vigor, precocious, annually prolific; fruit medium size, late, during long season, freestone.

HAND. Tree vigorous, hardy, not very productive, fruit large, mid-season, almost freestone.

IMPERIAL GAGE. Tree vigorous, upright, hardy, prolific; does best in light soils; poor on clay. Fruit mid-season, rather small, almost freestone.

JEFFERSON. Tree vigorous, slow to bear, uncertain, not as hardy as could be desired, pernickety as to soils. Fruit medium size, long ripening, semi-freestone.

LAWRENCE. Trees precocious and abundant croppers. Fruits large, mid-season, freestone.

McLAUGHLIN. Trees large, vigorous, hardy, precocious, fairly prolific. Fruit early, short season, medium size, clingstone.

PEARL. Trees medium size, healthy, hardy but not very prolific. Fruit mid-season, large, clingstone.

PETERS. Tree large, sturdy, hardy, healthy. Fruit large, late, short season, clingstone.

PURPLE GAGE. Trees large, sturdy, hardy, but not very prolific. Fruit large, mid-season, long ripening, often shrivel as they become fully ripe and are then of richest flavor, semi-clingstone.

WASHINGTON. Tree hardy, healthy, annually prolific, but rather slow to begin bearing. Fruit large, mid-season, freestone.

YELLOW GAGE. Tree large, sturdy, hardy and usually prolific. Fruit large, mid-season, long ripening, sub-acid, freestone.

SHROPSHIRE. Doubtless the best known Damson grown in America. While French is larger, Shropshire is sturdier, hardier, healthier. Trees remarkable for annual loads of fruit. Like most other Damson varieties, this is purely a culinary kind, though its fruits may be eaten raw after being slightly frosted. Fruit late, long season, small to medium, purple, clingstone.

TENNANT. A large, handsome, purple variety, rather better than most other varieties of its color. Fruit ripens late (before Italian Prune) and during a rather long season, clingstone. Trees sturdy, hardy, healthy and prolific. Popular for prune making on the Pacific Coast. Little known in the East.

TRAGEDY. An attractive purple Pacific Coast variety, scarcely known in the East. Fruit early, short season, fairly large, juicy, tender, sweet, clingstone. Trees sturdy, hardy and prolific.

WASHINGTON. See Reine Claude.

YELLOW GAGE. See Reine Claude.

JAPANESE GROUP

ABUNDANCE. Early, short season, medium size, mottled red, yellow-fleshed, very juicy, fairly sweet, moderately good, clingstone. One of the most widely adaptable of the Japanese varieties.

BURBANK. A better quality, slightly later and much longer season variety than Abundance. Medium to large, red, clingstone. Tree rather sprawling, very brittle, therefore subject to breakage unless trained and pruned with special care.

KELSEY. Latest and largest Japanese variety. So tender to frost it is unsafe to plant in cold sections. Successful in the South and in California whence the Eastern markets are supplied. Greenish-yellow, meaty fruits, of very good quality. Stone almost free in well-ripened fruits.

OCTOBER (Purple). A large, handsome, Japanese clingstone variety. Passable for dessert but better for culinary uses. Trees sturdy, healthy, but slow to begin bearing and uncertain croppers.

SATSUMA. A large, red, firm, but juicy-fleshed, clingstone, Japanese variety, one of the best of its group for culinary or dessert purposes. Trees medium size, fairly hardy and prolific though a little slow to begin bearing.

WICKSON. Perhaps the largest of all Plums, certainly of Japanese varieties. Handsome, purplish-red, pleasant-flavored, firm-fleshed fruit, which ripens from early mid-season till rather late, clingstone. Trees and blossoms tender to cold. In California a leader among Japanese varieties. In Georgia and other Southern States also popular. Not safe to plant in the Northeastern States.

POMEGRANATE

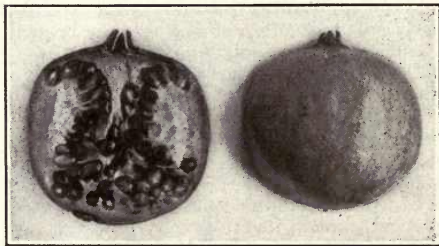


Fig. 111.—The Pomegranate

In a strip of warm coast, from the Carolinas to Texas, thence westward to California, some of the better varieties of Pomegranate should be included in family plantings, first, because of the beauty of the rather large shrub and the waxy coral

pink flowers; second, because of their fruits (Fig. 111). The pink or crimson pulp which surrounds the seeds, though acid in some varieties and in others a very refreshing sub-acid, is valued for desserts, punches, salads, for stewing with sugar and for making very refreshing beverages. The sweet varieties have a delicacy and sprightliness unique among fruits.

The shrub does best on moist but well-drained, rather heavy soils, though it will grow on a wide range from almost pure sand to heavy clay. On the former yields are smaller and the fruit less desirable than on the latter. Early Spring planting is best. Preferably the soil should have been in cultivation in previous years. Semi-monthly tillage during the growing season and fertilizing as for other tree fruits are all that is necessary. About the only pruning needed is to remove the superfluous suckers, dying or crossing branches, and the shortening of any too rampant growths.

The bush form is generally preferred to the tree style of training. The fruit is borne terminally on short spurs of slow maturing wood which bears for several seasons, when younger wood does duty. Most of the fruit is borne towards the outside of the tree, little in the center. Hence pruning except as above must be done intelligently so as not to remove too much fruiting wood. Well-grown fruits often weigh two to three pounds. The knack of opening the fruit is to cut a disc from the bulging calyx end, then to cut the hard rind along the partition walls, to force the segments apart and to remove the pulpy seeds for use (Fig. 112).

PAPER SHELL. A very large pale yellow, crimson-cheeked fruit with very sweet flesh of good quality. Noted as a home-fruit variety.

RUBY (Spanish Ruby). A large, bright red, crimson-fleshed, juicy, sweet, aromatic fruit. One of the best.

SWEET FRUITED and **SUB-ACID** are two other leading varieties grown largely and listed by Southern and California nurserymen.

WONDERFUL, considered the best variety, is a glossy, purplish red with deep crimson, very juicy flesh of excellent, rich flavor.



Fig. 112.—Best way to open a Pomegranate

QUINCE

No fruit with which I am familiar has so lasting a flavor as the Quince. Any one who will allow his curiosity to get the better of his judgment may prove that a single taste of a raw one will last a lifetime. Having once sampled a handsome specimen in my early boyhood I have no more hankering to take a second bite than I have to eat an unripe Persimmon; for as the surgeons say, "the operation was a success," my appetite for raw Quince has been permanently appeased.

While the Quince (Fig. 113) is said to be eaten raw as a dessert fruit in Persia, we in America can use it only after it has been cooked.

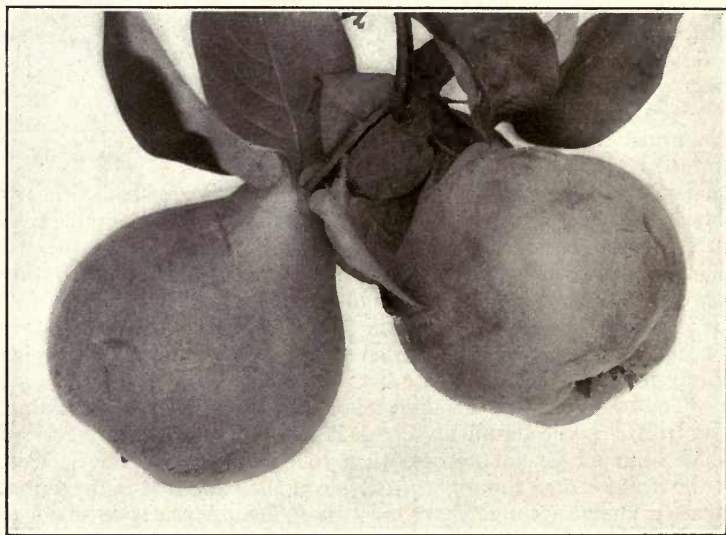


Fig. 113.—No home garden is complete without at least one Quince bush

For the making of jelly, marmalade, jam and syrup it is capable of playing a role which no other fruit can equal or even approach. When used alone it may be too strong-flavored for some palates but when toned down by combining it with other fruits, especially Apples and Pears, it is delicious and distinct. Every family orchard, therefore, should contain at least one tree. The orchard of my boyhood boasted twelve, so we could have twelve months continuous supply of Quince concoctions. By the way, after the juice has been removed from the cooked Quince in jelly making, the residue may be passed through

a colander to remove inedible parts and the strained stuff mixed with an equal quantity of Apple sauce. It is too strong to use alone.

Few fruits grown in America have been so badly treated. It is generally pushed off to a fence corner or a back-yard and forgotten until someone goes out and discovers that it has borne a few flea-bitten fruits, after the gathering of which it sinks into obscurity again for another year. From personal experiences in renovating just such neglected trees, as well as from having grown trees according to approved methods, I know that splendid fruits may be counted upon as an annual crop. Trees properly handled often continue to bear abundantly for forty years, surely a long enough time to make their care well worth the while.

Contrary to popular opinion, the Quince does best in a well-drained, warm, not a damp, cold soil. Damp, poorly drained soil tends to develop small, inferior, woody fruits. A fairly rich soil is better than one very rich, because the tree is less subject to blight when it grows moderately rather than rankly and the fruits are of superior quality. The deeper the soil the better, because the roots will thereby be encouraged to forage more deeply, the tree be more drouth-resistant and less likely to be injured by cultivating tools which would cut and break them if near the surface as they naturally are. Cultivation should always be shallow on this account. A good plan is to cultivate moderately in Spring and early Summer, working the soil towards the trees both to favor drainage and to protect the roots as well as to keep the surface loose and open. A cover crop sown about Midsummer is highly desirable, but care must be exercised to prevent the soil becoming too rich in nitrogen from the excessive use of legumes, such as Crimson Clover.

Since well-grown Quince trees reach 12 or 15 feet in height, planting should not be closer than 15 feet, though often 12 and even 10 are recommended. As the trees are long lived for the family orchard I would prefer to plant them at maximum distances and to use the intervening-spaces for small fruits until the Quince trees need all the space. When planted too close the trees become spindly and tall.

Because of its peculiar method of fruit bearing the Quince, if improperly pruned, is likely to become crooked and full of useless twigs. When this habit is understood the pruning is simple. The fruit buds are borne singly at the tips of twigs which develop from buds formed the previous season. Because of this new twigs grow in other directions, thus largely accounting for the irregular forms of the branches. With this point in mind pruning should aim to keep the top open and well spread out by removing superfluous interior branches and by shortening the shoots where fruit is desired. Two-

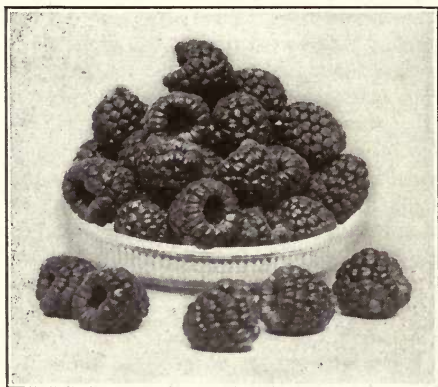


Fig. 114.—Please pass the powdered sugar and the cream

tender fleshed, excellent flavored varieties which ripen about mid-Autumn. The former is somewhat the earlier and the larger. Well-grown specimens often weigh a pound.

RASPBERRIES

I recently lost an argument with a lady who insisted that the Raspberry is superior to the Strawberry and that Henry Ward Beecher was mistaken when he declared "the Lord might have made a better fruit than the Strawberry, but he never did." Furthermore, she asserts that simply because "Beecher ought to know" he has, on account of this dictum, led countless other mortals to err. She claims, "He ought to have known better. A moment's reasoning would have convinced him. For Raspberries not only have a finer and wider range of color and flavor but they are always clean and they never break one's back to gather. Finally," she announced as a clincher, "the fact that their season follows that of the Strawberry proves that they were created later and are therefore the result of

year-old nursery trees are better than older ones for planting, and a height of 12 to 15 inches better than more for the length of the trunk.

Among the score of varieties listed in American fruit books only two are really very popular, though four or five others—VAN DEMAN, REA, BENTLEY, MEECH and FULLER—are grown to some extent. These two, ORANGE and CHAMPION, are both large, yellow,



Fig. 115.—Black Raspberries are wonderfully prolific

experience in the creation business." How can a mere man meet such logic? Can he assert that Strawberries are invariably clean? No; they are often gritty. Can he claim that they are easy to gather? No; for after picking an hour or more he's often yearned for a more supple, though none the less manly, frame. As to range of flavors of such fruit, are not honors about even? And as to colors, has not the Raspberry decidedly the advantage with its red, yellow, purple, black and varying intermediate tints against the Strawberry's reds and pinks with only an occasional albino? Then can he be blamed if, like Falstaff, he proves that "the better part of valor is discretion" and though vanquished, bobs up serenely, after the coast has cleared, with untarnished and unshaken loyalty—to the Strawberry?

My reader must not conclude from the foregoing banter that I seek to belittle the Raspberry. Really I think no home garden is complete without it.

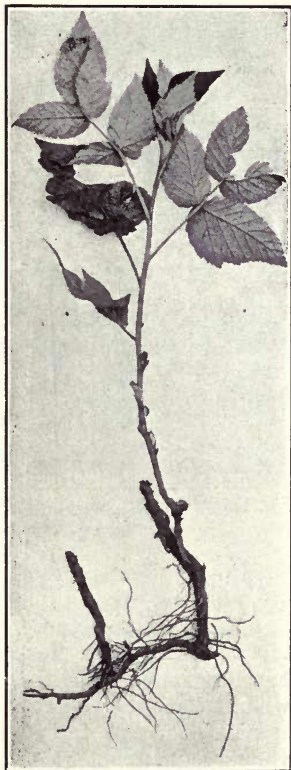


Fig. 116.—Red Raspberries are determined to "sucker"

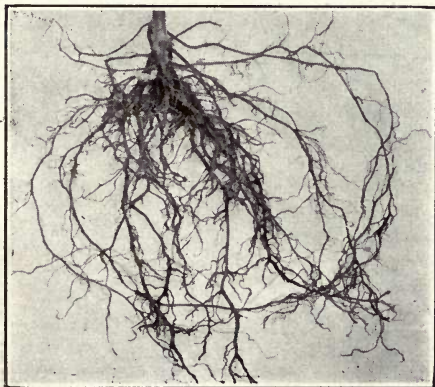


Fig. 117.—Well-rooted Black Raspberry "tip."
Note bud near the base of the stem

Indeed, if I had space I would plant a dozen, or a score, each of early and late, of black and red varieties, as many of one of the purple kinds, mainly for canning, and also of Golden Queen, the only really good yellow one, that is six kinds—or more!

In method of growth

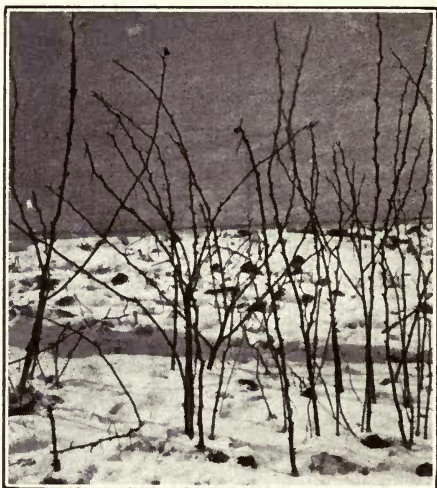


Fig. 118.—Red Raspberry before Spring pruning and thinning of suckers

all Raspberries resemble Blackberries since they have perennial crowns and biennial stems, which die after having produced fruit. Red varieties also develop new plants like Blackberries do from suckers (Fig. 118), but may also be increased by root cuttings. The black ones do not send up suckers but bend their canes over till their tips touch the ground. Then if these tips become anchored so they are not whipped about by the wind they form new plants (Fig. 117), as do also adjacent buds which develop stems near

the tips of the main canes. Half a dozen to a score of plants may often be developed in this way. Yellow-fruited kinds may propagate by either method, depending upon whether they have originated from the wild black or the wild red species. The purple-fruited varieties, many of which are known to be hybrids of red and black kinds, may develop new plants from cane tips, from suckers or by both methods.

Knowing the method of propagation, therefore, it is easy to increase the number of plants when necessary or to guard against reproduction beyond desired limits. The Red Raspberry and its

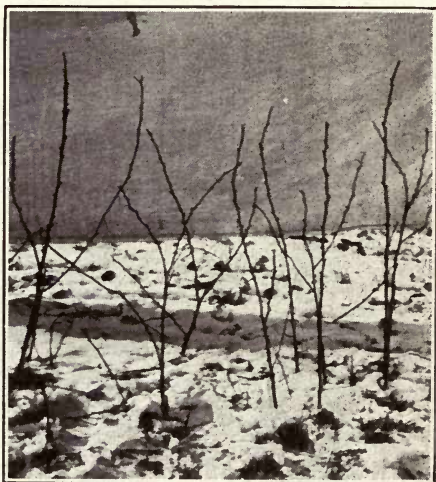


Fig. 119.—Red Raspberry after Spring pruning and thinning of suckers

yellow-fruited varieties, like the Blackberry usually demand close attention to prevent the formation of suckers (see Blackberry). It is best to plant all members of the Raspberry and Blackberry family in the Spring rather than in the Fall, because of the probable heaving and settling of the soil and breakage of roots when plants are Autumn set.

Cultivated Raspberries may be successfully grown wherever wild ones succeed, provided hardy varieties are chosen. Except in the mountains, however, they are not very successful south of Virginia.

In the cold North and high altitudes, it may be necessary to cover the canes during Winter, as in the case of the Blackberry. A deep, well-drained, fertile, somewhat heavy

loam, well supplied with humus, suits all species better than do lighter soils. Always the area should be well air-drained because many varieties seem to be more susceptible to damage, either by frosts or diseases, when grown in pockety or low land.

Varieties that naturally form restricted stools or crowns—all the blacks and some of the reds—may be grown in hills or checks if desired, (Fig. 121), but the usual way for the kinds that form many suckers is to allow



Fig. 120.—Black Raspberry before Spring pruning and thinning



Fig. 121.—Black Raspberry after being pruned in Spring

only three or four stems to the lineal foot of row, (Fig. 119), or not more than four or five, preferably three, to the hill or stool. When grown in hills five or six feet each way is necessary between the newly set plants; when in rows three or four feet with six or eight feet between rows, depending upon the size of the variety and the richness of the soil. During the first season vegetables may be grown between the plants and the rows. Frequent and thorough cultivation is necessary the first year and unless the plants are deeply mulched with straw, leaves or other loose material, also every other year, especially up to the time the fruits are ripening so as to keep the soil as moist as possible.

Besides the methods of pruning and training employed in Blackberry growing, Red Raspberries are handled in many ways, among



Fig. 122.—Spring pruning Raspberry canes level with the top trellis wire

which the following are perhaps most common. Black varieties more often than red ones have their young canes pinched like Blackberries to make them stocky and branchy. The first year no training is usually given, the plants being small. In the Spring of the second year before growth starts a stake is driven beside each hill—when the hill system is employed—and the previous year's canes tied to it. The canes that grow later in the season develop outside those tied to the stake.

With solid rows and fairly dwarf kinds all the suckers in the row may be allowed to grow without staking or trellising, only those between rows being destroyed. The following Winter the inferior ones are removed. With large-growing varieties the canes may be left unpruned until the following Spring, when the best ones are shortened

to about three feet in height, the inferior ones being destroyed. Sometimes the long canes are trained to trellises either erect (Fig. 122) or bent over. The trellises may be either with one wire above the other, the first at 18 to 24 inches from the ground, the upper at 30 to 36 inches, or with both wires at about 30 inches fastened to wooden cross-pieces about 15 inches long and nailed on the tops of posts.

In the first case the canes may be fastened erect to the two wires and cut about six inches above the upper one, or they may be bent over the upper one and fastened to the lower one without cutting. In the second case they may be tied half to one wire and half to the other or all to one. In the former of these cases the new canes are allowed to grow without being fastened to either wire; in the latter they are fastened to the wire that is not at the time supporting the fruiting canes. The main advantages of trellising are that the canes do not interfere with picking or cultivating and there is less likelihood of breakage.

As soon as a cane is done fruiting it should be cut out to favor development of the young ones. By good care a home Raspberry plantation should last six to ten years or even more. When the plants begin to fail a new plantation should be started, the old one being destroyed after the new one has begun to bear.

Among promising new varieties not described below are Sunbeam, Ohta and Empire, all reds. The following are already well known:

BLACK VARIETIES

BLACK DIAMOND. An early, large, firm, sweet, high-quality berry, borne abundantly on strong, hardy canes. Highly prized for evaporating.

CUMBERLAND. By many considered the finest of the black varieties because of its mid-season, extra large, firm, sweet, high-quality berries and its vigorous, hardy, stocky, prolific canes.

FARMER (Plum Farmer). A strong growing, hardy and prolific, early, short season variety, with large, meaty, firm, high-quality berries which ripen a week or so earlier than Gregg. The New York Experiment Station says it is "the best fruit of this type grown on the station grounds."

GAULT. A vigorous, hardy, black variety, which ripens its berries at the same time as Gregg and later in the season produces more or less fruit on the young growths.

GREGG. For many years a leading black variety because of its great prolificacy and the large size of its mid to late season firm, well-flavored berries.

KANSAS. One of the most widely planted of Black Raspberries because of its strong, hardy, prolific canes and its jet-black, firm, sweet, excellent flavored berries produced from early to mid-season.

SCARFF. A seedling of Gregg said to be hardy, larger than Cumberland and highly prolific.

PURPLE VARIETIES

COLUMBIAN. A strong growing, hardy, highly productive variety with very large, fairly firm, dull purple berries which follow Cuthbert. It is particularly good for canning because it holds its form and size remarkably well.

ROYAL (Purple). A hardy, deep crimson, prolific, firm-fruited, late variety which produces its new plants from the tips of the canes.

RED VARIETIES

BRILLIANT. A hardy, prolific, large, firm, red-fruited variety which follows St. Regis and precedes Cuthbert by a week or ten days.

CUTHBERT. For over 30 years the leading mid and late season variety because of its large, crimson, fairly firm, high-quality fruit and because the plants are hardy and readily adaptable to a wide variety of soils and climates.

HERBERT. A Canadian variety highly recommended for its hardiness, productiveness, and large, juicy, firm, high-quality red berries. It is the finest variety I have ever fruited.

KING. An early but long season, bright red, firm, large-fruited variety of moderate quality and fair productiveness. The berries drop very easily from the plants when ripe. The canes are sturdy, hardy and produced sparingly. Of the red varieties it is therefore one of the surest to "stay put."

MARLBORO. An early but long season, prolific, large, light crimson, very firm berry of good quality.

PERFECTION. A hardy, very large, firm, bright scarlet, high-quality variety of long season.

HANERE (St. Regis). A very early, bright red, prolific, medium-sized berry with hardy, healthy, drouth-resistant canes. A second period of fruiting begins on the young canes shortly after the old canes have ceased fruiting and continues until mid-Fall. Unless the very numerous, superfluous suckers are removed while soft the fruit of the first crop will be small and no second one may form.

WELCH OR HONEY. A vigorous, hardy, prolific, mid-season, large, crimson, very sweet-fruited variety, considered one of the best for home use.

YELLOW VARIETIES

GOLDEN QUEEN. A descendant of the Cuthbert, which it resembles, except the yellow color of its fruits. Decidedly the best American yellow variety. Needs extra work to prevent undue development of suckers.

SAND CHERRY

In the Prairie States the Western Sand Cherry (*Prunus Besseyi*) is a native shrub which grows three or four feet high and in Mid-summer bears variable, dark purple fruits about half an inch in diameter. Recently Prof. N. E. Hansen of the South Dakota Experiment Station has hybridized it with other species and produced varieties that give promise of being more useful than even the best wild forms which are highly prized for culinary purposes.

Plants of the original species have been grown more or less in other parts of the country, but have not made much headway where other Cherries can be grown because they are less abundant producers and the fruit is neither as large nor of as good quality as even the small, sour Cherries. Where Cherries fail, however, where space is at a premium or where a distinct flavor is desired, the Sand Cherry (Fig. 123) may be planted. It will succeed in any well-drained, light soil, with practically no attention except the removal of old failing stems.



Fig. 123.—Native Sand or "Dwarf" Cherry

STRAWBERRY

Perhaps no quotation attributed to Henry Ward Beecher is so popular with fruit lovers as "The Lord might have made a better fruit than the Strawberry, but he certainly never did." I have yet to meet or hear of the man or woman who, after enjoying an ample dish of luscious, home-grown, really ripe Strawberries, liberally dusted with powdered sugar and drowned beyond resuscitation with thick cream, would enter into a theological discussion of this question! Howbeit, I have ingloriously disputed a somewhat different phase of the subject with a Raspberry "rooter." (See page 180.)

Apart from what Beecher might call its "betterness," the Strawberry has its own particular appeal to the home fruit grower. Like the Raspberry and the Blackberry, it reaches its highest quality when it ripens fully before being gathered—a condition it can never be allowed to reach when grown for the market; like the Currant and the Gooseberry, it is easy to grow with ordinary good care and in a wide range of country; but more than these, it requires the smallest amount of space in which to grow. There may not be room for standard or dwarf trees or even for Blackberries, Raspberries, Currants or Gooseberries, but everyone who has even no more than a few square yards



Fig. 124.—Dr. Burrill, one of the best Strawberries

of ground may grow Strawberries, and grow them to perfection. Proceed as follows:

As early as possible in Spring, plow or dig the ground and pulverize the soil deeply with harrow or rake. If the soil is light make it firm by rolling or pressing with a board, laid flat and walked on; if heavy no packing may be needed. When possible manure the area the

Fall previous or at least several weeks before plowing if the manure is fresh, if old apply it just before digging or plowing. A fair rule to follow is about one to two pounds to the square foot, equivalent to 20 to 40 tons to the acre. If not convenient to apply previous to plowing the manure may be placed between the rows after the plants have been set. It will thus serve as a mulch and a supplier of plant food which later will be washed into the soil by showers. Manure not "strawey" should not interfere with cultivation or hoeing. For the ordinary home garden of about 200 plants occupying 500 to 600 square feet, five or six wheelbarrow loads will be about right—one barrow load to each 100 square feet.

One special caution must be made: Never make a Strawberry bed on ground that has been in any kind of sod, because white grubs are sure to be there and will destroy the berry plants. It is claimed that Clover, Alfalfa, Blue Grass and some other sods are not breeders of this pest, but it is just as well to err on the safe side and to avoid all sod where possible, and where not possible to plow or dig the area the previous Fall so as to kill the grubs.

In setting the plants have the crowns set level with the surface of the ground. If so high that the roots are exposed, the plants will dry; if the crowns are covered even slightly they will usually decay or the plants be stunted. As with setting other plants, the soil must be firmed well about the roots. If the roots are long it is well to shorten them by laying them across the hand with the crowns between the index finger and the thumb and then shearing off what root-parts extend lower than the little finger and the ball of the hand. This will leave the roots about four inches long, easy to handle when trans-

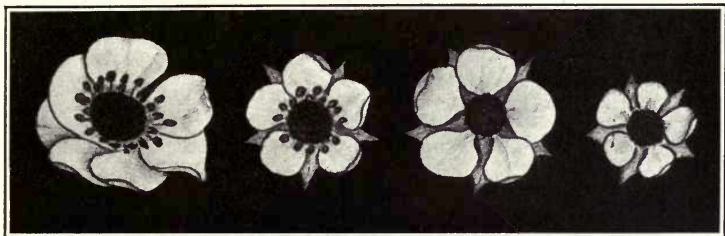


Fig. 125.—Bisexual or “male” Strawberry blossoms on the right, pistillate or “female” on the left

planting. As trimmed it is well to throw them into water to keep them from drying.

Should it not be possible to prepare the ground as soon as the plants arrive from the nurseryman, set them after pruning in a V-shaped trench, not in bundles but separated. It is a good thing to fill the trench with water before placing the plants in it because they will thus come in close contact with the soil and be moist. Fill in with fine earth and firm the soil against the roots with the feet. Several rows may be placed close together—about six inches between them. If the soil becomes dry don't sprinkle it but drench it so thoroughly that it will be soaking wet at least a foot deep. Plants may be kept in this way six or eight weeks.

Before digging them up for transplanting be sure that the ground in both the little bed and the garden area is moist so that the plants will suffer the least possible check. Advantages of buying plants early and treating them in this way are that one stands a better chance of getting what he wants, he has them just when he is ready to plant, does not have to hustle unduly—the plants being safe, he can spray them very quickly, cheaply and effectively, he can delay planting until the ground is in just the condition he wants it and can reduce weed trouble



Fig. 126.—A prolific Strawberry plant

by keeping the plants out of the prepared bed until late Spring if he desires, by which time the worst of the weed seeds will have germinated and been killed by cultivation.

It is important to know whether the varieties chosen are perfect or imperfect; that is, whether they have bisexual or only pistillate flowers (Fig. 125). The former are self-fertilized, the latter depend on the pollen from bisexual flowers. Hence when the pistillate kinds are chosen because of their high quality and their productiveness, or because they are freer than the staminate from the attacks of weevil, it is necessary to have other plants of perfect kinds near by to insure a good set of fruit. A good proportion and arrangement is one row of staminate (perfect) plants, then three of pistillate, then another row of staminate and so on across the patch.



Fig. 127.—Good promise of luscious Strawberries

Some varieties make better combinations than do others either because they bloom at the same time or they have an apparently better affinity. This point can usually be decided by the Strawberry nurseryman. Some plant growers are so particular that they will not fill an order where the customer is making a mistake in a pollenizer for a certain variety, but will write and suggest other varieties. So when ordering plants it is well to ask advice on this point and allow substitution of pollenizers.

It is generally recommended that all blossoms that appear on newly set plants of "ordinary season" varieties be destroyed; and those that develop on "ever-bearing" kinds be also removed until

July first or even later, because this tends to strengthen the plants for fruit production (Fig. 126).

From the very start keep the ground loose, open, and free from weeds, by weekly hoeing or wheel hoe, (horse cultivation in a large patch). Avoid cultivating more than two inches deep and very close to the plants because of the shallow roots. By keeping the surface inch dusty, by frequent tillage, moisture will be held below where needed and weeds will not have a chance to grow. Never cultivate while the soil is wet.



Fig. 128.—Setting a runner Strawberry plant in a flowerpot

Strawberries do best in rich, fairly moist soil and in cool seasons. In the North, plants started from runners in flowerpots may be set in July, August or September, but generally the runners are taken from the old plantation in Spring and planted where they are to remain and fruit the year following. For the home garden where only a few score plants need be handled, the pot method is specially desirable because the plants should bear a very fair crop the following Summer and still be in good condition for another season's crop.

If well-rooted runner plants (Fig. 129) can be secured in July, or early August, and transplanted just before a good rain, or each plant given a pint or so of water, held in a little basin of soil around it, often as good results may be secured as from potted plants. It may be necessary in case of a dry spell to water the plants two or three times. Such watering should always be in little cup-like hollows of soil with the plants as the centers. After the water has seeped down and the soil has lost its paste-like appearance, some loose, dry soil should be drawn over the wetted earth to form a dust mulch and check evaporation.

In order to get potted plants (Fig. 128) all that is necessary is to sink 2, 2½ or 3-inch pots, rim deep and filled with soil, in the beds. The runners still attached to the parent plants are placed with their rosettes of leaves immediately over the pots. A clod or a pebble will hold the rosette in place until it has developed roots. In two or three weeks the pots should be "full of roots" (Fig. 130) and the plants may be set in the beds.

The old-fashioned and lazy way of growing Strawberries was to lay out a bed and let all the plants produce as many runners as they "wanted to." Result: smaller and smaller and fewer and fewer berries. The advance from this primitive way is the matted-row system (!) in which the plants are allowed to form an unbroken ribbon two to three feet wide from end to end of the plantation. This "method" is still popular in field culture.

An improvement on it is the hedge-row system for which the

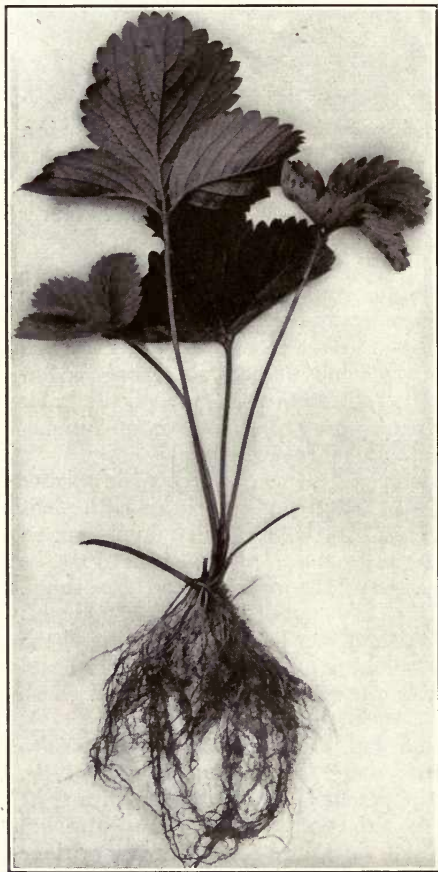


Fig. 129.—Potted Strawberry plant with earth washed away to show root development

plants are set about two feet asunder in the rows which are three feet apart. Only two runner plants from each of the plants set are allowed to take root one on each side of the parent plant and in the line of the original setting. Thus in the completed row the plants will stand eight inches asunder. No other runners are allowed to take root. Advantages of this system are that the plants become large, strong and able to bear heavy crops of berries, which average much larger than those of the matted row.

In the hill system the plants are set either in checks from 18 to 24 inches apart so they may be cultivated in both directions, or 15 to 18 inches apart in rows 24 to 30 inches apart. In these cases no runners are allowed to take root except when new plants are needed for making a new bed. The result is very large, sturdy plants, which

produce the largest and finest berries of all systems. The main drawback to this system is the work required to prevent the rooting of runners; but this is balanced by the lessened cultivation work around runners. Such work is least when the plants are set in checks so cultivation may be given in both directions.

While the Strawberry is a hardy perennial herb, it may, however, be killed by the heaving of the soil, due to alternate thawing and freezing during Winter. This fate may easily be prevented by mulching (Fig. 131) with marsh hay, shredded corn fodder or some other material free from weed seeds. The time to apply such a mulch is

after the ground has frozen hard enough to bear a team of horses and a wagon. Enough should be applied to cover the plants two or three inches deep. As soon as Cherry and Pear buds begin to swell, but not much earlier, this material must be moved off but placed around the plants, otherwise they might be smothered. As it will be needed, however, to check evaporation of water from the soil, to keep down weeds and to keep the berries clean, it must be left between the rows and the plants in the rows and there allowed to remain at least until after the fruit is gathered. Such weeds as struggle up through the mulch may be easily pulled after a rain or cut with a sharp hoe. The fewer and smaller the weeds and the fewer the Strawberry plants, the larger and finer the fruits and the longer will the bed continue to bear.

After harvesting (Fig. 132) is over proper attention will make it practicable to use the bed for a second, a third or even a fourth crop, though because of certain insects it is best to allow the bed to



Fig. 130.—Potted Strawberry runner ready to transplant

bear only two or even only one crop. When a second crop is to be grown the leaves must be cut close to the ground with a scythe or a lawn mower as soon as the last berries have been gathered.

If the mulch is of shredded corn fodder or other material that clings close to the ground, it should all be raked off with the cut leaves, placed in a compost pile and covered with sods and earth for making "good soil." If the material is light it may be made as loose as possible by lifting and shaking with a hay fork and in a day or two when very dry burned right where it lies, the fire being started on the windward side of the patch in several places so as to be hastened by the wind. The patch will look very dismal for a few days and the fear will probably arise that the plants have been ruined, but unless the mulch is allowed to remain thickly over the plants, no damage will have occurred and the eye will in due time be rejoiced by a beautiful bright growth of fresh green leaves. Burning should not be done unless the soil is moist and the mulch and leaves dry.

The advantages of burning are that the old, perhaps diseased leaves and stems and countless insects are destroyed and the plants take a new lease of life. Which-ever plan is adopted the spaces between the rows should be cultivated shallow and a dressing of old manure given, both to serve as a mulch and as a supply of plant food. When this cultivation is given a layer of about half an inch of soil should be raked over the crowns. When either the hill or the hedge-row system is practised the runners must be cut off the same as during the first year, except where a few may be needed to fill gaps.

While the Strawberry thrives in every State of the Union and in every Province of Canada—is in fact the most cosmopolitan of all fruits—some varieties are better adapted than others to certain conditions. Most Strawberry nurserymen know what ones

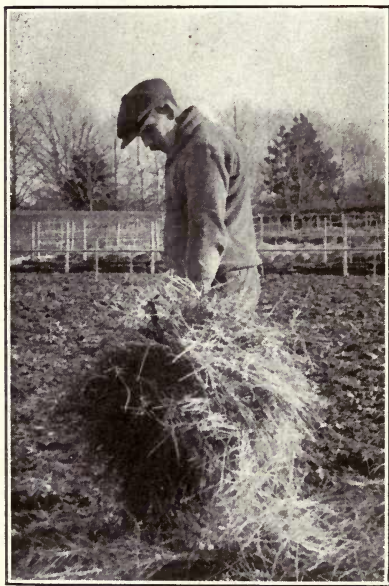


Fig. 131.—Spreading the Winter mulch on the Strawberries

are thus adapted, so the uninitiated should indicate the type of fruit he wishes to grow and leave the selection of varieties to them. These men are not merely interested in selling a few plants; more than perhaps any other group of nurserymen, they seek the good will of their customer so as to secure repeat orders and orders from the customer's friends. Often when the nurseryman sees that the customer is making a mistake in selecting he will suggest changes that should be more satisfactory.

Another advantage in relying upon the judgment of the nurseryman is that because the varieties of Strawberries change more rapidly than do those of any other fruit, one can be surer of getting up-to-date varieties. The significance of this will be apparent from two instances: First, during 1894 and 1895 the Michigan Experiment Station at East Lansing tested about 400 varieties of Strawberries, all then offered by nurserymen all over the United States. Since then so many new varieties have been introduced, and so many of the old list found wanting, that of the 400 scarcely a score are now offered by nurserymen and perhaps less than a dozen are at all popular. Second, Dr. S. W. Fletcher in technical bulletin No. 1, of the Virginia Experiment Station, discusses North American varieties of the Strawberry and "includes 1879 names." Among these he picks out 34 "most prominent," but of these scarcely more than a dozen were known prior to 1900. Such facts as these suggest the inadvisability of discussing Strawberry varieties.



Fig. 132.—The six-box carrier basket is convenient for gathering Strawberries

Among the thirty-four "most prominent" the following may be considered most worthy: AROMA, BEDER WOOD, BRANDYWINE, BUBACH, CRESCENT, DUNLAP, GLEN MARY, MARSHALL, MICHEL, SHARPLESS, WARFIELD and WILLIAM BELT. Besides these, however, are many at least as good which should be considered and tested to determine which best suit the family demand. Many Strawberry nurserymen sell plants in lots of 25, a number convenient to handle and sufficient to make a test. In making a choice of varieties it is well to choose at least three kinds, one early, one mid-season, and one late, so as to cover a month in the usual Strawberry season. In addition, one or two "ever bearing" kinds should be included so as to have berries until late Fall. Of these there are only a few, of which PROGRESSIVE, SUPERB, PEERLESS, AMERICUS, ADVANCE, FORWARD, ONWARD, and FRANCES are perhaps best known, with the first two as the leaders.

VIBURNUM

Many people know the so-called "high bush Cranberry" as a handsome, ornamental shrub, when covered with scarlet fruit in Fall or Winter. In rich soil specimens often reach 15 to 20 feet. The berries, borne in large clusters, are too acid and puckery to be eaten raw, but they make an excellent jelly and a sauce considered by some people equal to that made from Cranberries. As the bush is hardy in the United States and Canada it may be grown anywhere. Should it become overloaded with fruit, it may bend to the ground and perhaps not lift itself erect again. Such a catastrophe may be prevented either by growing the plants as trees, each with only a single trunk, or by propping the stems. Each stem may have its own prop or each may be wired to one central prop, and to each other at equal distances apart. Perhaps the last method is the most feasible.

This Viburnum has special value to fruit growers because of its freedom from orchard insect pests, its ability to make a good hedge or windbreak and its fruit, which if not used for human consumption is highly relished by birds during late Fall and Winter.

WINEBERRY

This hairy, rather than spiny, hardy, Raspberry-like plant often grows ten to fifteen feet in a season. Like the Black Raspberry, the canes take root at the tips to form new plants. The brilliant scarlet fruits, which resemble small Red Raspberries, have a very refreshing, sprightly flavor—when they can be gathered—but robins, catbirds and other feathered friends also know a good thing when they see it.

Diverse Species of Nuts

Almond—Butternut—Cashew—Chestnut—Chinquapin
Cobnut — Cocoanut — Filbert — Hazelnut — Hickory
Peanut—Pecan—Pistachio—Walnut

EVERY year nuts are being eaten in increasing quantities. Not only are they used by confectioners, cake and ice-cream makers, and as dessert, but some of them are rapidly approaching the rank of staples in the daily dietary of the nation. Since more than a dozen distinct species are now grown to some extent in the United States, they are briefly discussed in this volume—Almond, Butternut, Cashew, Cocoanut, Chestnut, Chinquapin, Filbert, Hazelnut, Hickory, Peanut, Pecan Pistachio and Walnut. With the exception of the Peanut, which is an herb, all these are either shrubs or trees.

Many of the species so far cultivated are best propagated by budding or grafting. Thus desired varieties may be secured. In ordering nursery stock, therefore, it is as important to buy grafted or budded stock as in the buying of Apple, Peach or Cherry varieties, because seedlings, especially Persian (English) Walnuts, Pecans, Almonds and Chestnuts, are generally disappointing. Another advantage is that grafted and budded stock, when properly managed, will usually bear sooner than seedlings, sometimes in even less than a quarter of the time! Such trees are, therefore, worth the higher prices nurserymen ask for them.

The tradition that nut trees are hard to transplant is not strictly correct. However, they do require more care than most fruit trees. More severe reduction of both roots and tops than in the case of fruit trees has given best results, preference, as with fruit trees, being given to young trees—two years old at oldest, one year better still.

Some nut trees have decided preferences as to soils. For instance, Filberts, Hazels and Chestnuts do best on somewhat acid soils. Chestnuts prefer sandy land to clay, and they almost fail on limestone soils. Hickory and Walnut must have either neutral or alkaline soils, preferably rich and well supplied with humus. They may be made to succeed where acid soils are sweetened by liming; and Chestnut may be given a start by making the tree holes large and filling them with sandy, acid soil.

ALMOND

Except in specially favored sections of the Pacific Coast States, Utah and the South, the Almond is a failure commercially, because its

blossoms are so easily injured by frost. Even in the States where it is grown commercially fire pots are kept as insurance against frost damage. People elsewhere who like to gamble with nature have succeeded with it in an amateur way by planting it on northern slopes, in moist, but well-drained, fertile soils. But unless both the site and the locality are free from frosts during blooming time, Jack Frost is sure to win nine games out of ten. The trees are handled in practically the same way as Peaches. Leading varieties grown in the West are Ne Plus Ultra, Nonpareil, IXL, Languedoc and Drakes. A hard-shelled Illinois variety, Ridenhower, is propagated by North-eastern nurserymen for planting in home orchards. The nuts are, however, inferior to the ones mentioned above.

BUTTERNUT—See Walnut

CASHEW

Cashew trees, natives of the tropics, have been grown in Florida and California. Perhaps they may also be grown in warm parts of the Gulf States and those of the Mexican border. They often reach a height and a spread of 40 feet. The nuts appear singly at the tips of Pear-shaped fruits called Cashew Apples and borne in clusters. In form these nuts resemble overgrown Lima Beans, but are gray or purplish. Beneath the outer skin is a caustic juice which acts on the human skin somewhat like poison ivy. This poisonous property is destroyed by roasting—the way the nuts are always prepared for market and immediate consumption. The kernels underneath an inner skin are among the most palatable of all commercial nuts.

CHESTNUT

At present it is risky to plant the Chestnut in States where the Chestnut blight has recently been prevalent. Like other epidemics, the disease may disappear or a way may be found to prevent its damage. But until the scientists announce that happy time it will be better to devote money, time and energy to other orchard fruits.

Five species of Chestnut are of importance; one of these is European, one Japanese and three American, two being "Chinquapins"—little fellows. These last, though smaller, are earlier than the other or true American Chestnut and all the American species are better flavored but much smaller than their Old World cousins, which are coarse in comparison. The Chinquapin has produced few, if any, named varieties; of the other American species, scarcely a score, the following are the best known: Watson, Otto, Dulaney, Rochester, Griffin, Murrell, Hathaway, and Kitcham. Among the many Japanese

varieties the following are most grown in America: Mammoth, Reliance, Superb, Alpha, Success, Beta, Prolific, Felton, McFarland, Killen, Parry, Biddle, Kerr, Martin, Boone, Kent, Hale, Black, Coe and Giant. The English kinds popular in America are: Nouzillard, Styer, Anderson, Scott, Lyon, Ridgley, Bartram, Quercy, Combale, Paragon (Sober), Darlington, Numbo, Moncur, Chalon, Dager, Marron and Corson.

The American Chestnuts grow to huge trees, sometimes more than 10 feet in diameter and 100 feet tall. Therefore, they need ample space—not less than 40 feet. One of the Chinquapins sometimes exceeds 25 feet in height, but is usually less than half that; the other is a mere shrub rarely more than five feet high. They usually form thickets. The European varieties may be planted 30 feet apart and the Japanese 20 feet as they are smaller growing than the American. At the start the trees of the three larger species may be set 10 feet apart, each second tree to be removed when the branches begin to touch. The European and American may be thinned a second time when the trees left the first time touch each other. Thus several crops of nuts and a goodly yield of wood may be secured each time.

A favorite way to propagate each of these species is by grafting (page 72) upon "sprouts" developed from stumps where Chestnut trees have been cut down. Thus rocky hillsides and other waste land may be utilized. When planted in orchards the methods of culture are the same as for other fruits, though mulching may prove satisfactory also. While the trees are young they should not be allowed to ripen all the fruits they set, as this might check their growth.

CHINQUAPIN—See Chestnut

COBNUT—See Hazelnut

COCOANUT

The Cocoanut is the world's most important nut. It is grown in all tropical countries, but except in Southern Florida and warm localities from Texas to Southern California it cannot be grown in the United States. Even in these places it is more likely to be ornamental and a curiosity than a commercial fruit. The tree, a palm, is rarely found in nature far from the sea coast but can be grown on sandy soils farther inland. Though it is large-growing—60 to 100 feet tall—it does not need relatively as much space as more spreading trees. Under favorable conditions it will begin to bear in eight to ten years, sometimes less, and when in full bearing will yield 80 to 100 nuts annually for 70 to 80 years.

FILBERT—See Hazelnut

HAZELNUT

Filberts, Cobnuts and Hazelnuts all belong to the same botanical group of plants. Filberts are mostly oblong in shape and have husks far longer than the nuts. In Cobnuts the husks barely cover the roundish, angular nuts. The round, thick-shelled Hazels extend beyond the husks much like acorns do from their "cups." Filberts are largely grown in Europe and exported to America. In the Eastern United States they have not succeeded, probably because of tenderness to frost, susceptibility to disease, improper management and lack of varieties adapted to our conditions. On the Pacific Coast trials indicate that conditions are more favorable. Apparently they do best in well-drained, fairly rich soil, steady Winter weather which will prevent opening of the flowers and the absence of American species from the locality, for this species, while not seriously injured by disease, is a disease-breeder for the European kinds. Bordeaux mixture and self-boiled lime-sulphur have been suggested as remedies for the disease, but so far as I know have not been tested.

The three American species, while somewhat cultivated, have produced no named varieties. They may be started like the Filberts from Fall-sown seed, from transplanted suckers and layers or by budding or grafting. The plants should be set 10 to 20 feet apart in Fall or Spring, and preferably headed at 12 to 24 inches, though they may be grown in stools like Currants. In the former case suckers must be kept down; in the latter thinned out. Pruning in after years is best done shortly after blossoming. Spur-formation is encouraged by shortening strong shoots, and fruit-bearing by cutting out old wood that has fruited.

When the husk begins to turn brown is soon enough to start harvest; but it must then be done promptly or many nuts may be lost by falling on the ground. They must be spread out thinly to dry or they will mold. After drying and the husks removed, the nuts are best kept when sprinkled with salt in closed kegs and stored in cold, dry quarters. Some seedlings of European origin but American development are: Grandis, Spanish, Jones, Alba, Red Aveline, Cosford, Lambert, Du Chilly, Purple-leaved, Caspa and Downton.

HICKORY

Four species of Hickories are valued for their nuts; the Pecan (page 202), the Shag-bark, the Shell-bark and the Pignut. Of these the Pecan is easily the most important. Of the other three the Shag-

bark is best flavored, though the Shell-bark is a close second. The Pignut is decidedly the poorest. As all these species are slow growing they demand fertile soil, such as river bottom land and well-drained loams. They are all large growing so must not be planted too close together—40 feet or more apart.

They are all difficult to propagate, so prices for trees of named varieties will seem to be high. They should always have been transplanted at least once in the nursery before being sold. This will tend to produce fibrous roots and thus make transplanting easier. Cleft grafting (page 72) on seedlings two to four inches below the surface of the ground, using scions four to six inches long and cut from the tips of twigs, is the most satisfactory amateur method of getting new varieties to grow. Seedlings may be started where the full-grown trees are to stand and scions secured from trees of the desired varieties.

After the grafts have been made earth must be mounded so as to bury both stock and scion. The shoots that develop must be tied to stakes to prevent injury.

The leading Pignut variety is Brackett; the three principal Shell-barks are Rieke, Weiker, and Lefevre. More than a dozen Shag-barks are becoming prominent; Woodbourne, Swain, Vest, Curtis, Rice, Jackson, Dover, Milford, Eliot, Kentucky, Hales (or Hales' Paper-shell), Meriden, Kirtland and Leaming.

PEANUT

The Peanut is a staple crop in the South, but it may be grown as far north as Delaware and adjacent New Jersey. I have grown it as a curiosity in Southern Michigan and Ontario, but the nuts are not as numerous nor as large or fine as the Southern ones. On Long Island I have been told it has done somewhat better. It does best in rich, light-colored loams. The soil must be loose and very friable so the nuts may burrow easily, otherwise they will not develop. Spanish Peanuts are quicker to mature than the larger kinds. They need about 120 days.

As soon as the soil is warm it is prepared as for Potatoes or garden truck and the seeds sown like Beans, bunch varieties in rows 10 or 12 inches apart, running kinds 12 to 15 inches, the greater distance being used in rich soils. Cultivation is the same as for Beans until the plants cover the ground. At the last cultivation, at about blossoming time, soil must be worked up toward the vines which from then until harvest must not be disturbed.

Harvesting may be done with a Potato fork just before frost or the nuts may be injured. After lying on the surface to dry for a few hours the vines are stacked or racked loosely to dry. When

thoroughly dry the nuts may be picked off the vines, otherwise they will shrivel and be worthless. After picking they should be covered with dust and kept dry and well ventilated till needed. The varieties most cultivated in America are Virginia Bunch, Virginia Runner and Spanish. Other well-known kinds are Tennessee Red, Valencia and African. The last four are small-seeded kinds.

PECAN

By far the most important native nut is the Pecan, both because it has hardy Northern varieties and because other varieties are of the "paper-shell" and "solid meat" classes. During the past two or three decades it has been planted so enormously in the South that it bids fair to be the most important nut grown in this country, thus outranking the Persian Walnut (page 203). The hardy varieties can be grown from Long Island to Iowa and southward; the tender ones in the Gulf States, the Atlantic Coastal Plain, as far north as Virginia, or even Southern New Jersey and in favored localities on the Pacific Coast.

It does best in well-drained, deep, fertile loams, but readily adapts itself to less favorable soils. The trees, preferably budded or grafted varieties, are planted and managed like other orchard trees except that they should be set not less than 60 feet apart, preferably 75 feet. Until they fill this space other crops may be grown between. Among the hundred varieties so far named, the most valued for the Atlantic Coastal Plain and to Mississippi are: Schley, Van Deman, Stuart, Alley, Curtis, Bradley, Pabst, Russell, Moneymaker, Success, Delmas, and President. In Texas, Kincaid, Colorado, San Saba, Halbert, and Sovereign are leaders. These two groups are apparently not interchangeable as to territory. They both fail also farther inland. Indiana and Illinois have given most of the hardy Northern kinds: Warrick, Major, Busseron, Niblack, Greenriver, Indiana, Buttereck and Posey.

PISTACHIO

The Pistachio, though a native of Syria and Persia, is becoming popular in Southern California and West Texas. It has been successfully grown in Kansas and one has even withstood the Winters of Connecticut. Properly it is a mild climate tree which grows to about 20 feet in well-drained soil. It is slower growing than either the Persian Walnut, the Almond or the Pecan.

The "Green Almonds," as the nuts are often called, form loose clusters inside a leathery sheath. They have stout but thin, smooth shells which generally open on one side when roasted. The green, delicately flavored kernels are eaten with salt after being roasted, but

are more popular for flavoring cakes and confections, especially ice cream. They become rancid very readily.

WALNUT

Edible Walnuts naturally form four groups of which the most important is the Persian or so-called English which is the most cultivated in the world. Asiatic Walnuts are second in importance, but they are rather curiosities in America. Our native species are the black and the white, the latter properly Butternut. Except for a few named varieties of which the Thomas Black Walnut is best known, the last two groups are scarcely in cultivation, the wild trees supplying present demands.

Within the past quarter century hardy varieties of the Persian Walnut have been grown as far north as the Niagara district, Southern Michigan and Connecticut and have given considerable impetus to home and even a few business plantings. Much dissatisfaction has arisen because of the variableness of the product due to the planting of seedlings rather than grafted stock. Except for the origination of new varieties, none but grafted, or budded trees of well-tested varieties should be planted.

In the Pacific Coast States the Persian Walnut is a commercial staple. Everywhere it does best in deep, well-drained, but moist loams, but will succeed in others. So far varieties have not been sufficiently tested in the East to recommend any, but the ones most planted are Boston, Potomac, Lancaster, Rush, Holden, Nebo, Hall and Barnes. They all appear to be worthy of further trial, especially when budded upon Black Walnut stocks. Varieties popular in the Pacific Coast States are Mayette, San José, Franquette, Concord, Chase, Placentia, Prolific and Eureka.

In general the Walnut is managed like other orchard fruits of the neighborhood. When the nuts begin to fall others may be jarred from the trees at intervals of a week or two for perhaps six weeks. For home use they may be dried in an airy barn or loft. Black Walnuts may be cured in their fleshy husks, but preferably with these removed. Butternuts are always cured with their skins on.

CHAPTER XIII

Home Fruits as Educators of Public Taste*

Where Western and Other Growers of Choice Fruits Got
Their Standards—Originating New Varieties

WHILE the past five, and especially the last three, decades have seen more remarkable improvements in horticultural practices than did the previous five—for instance, the development of modern tillage, fertilizing, cover cropping, spraying and rational pruning—which have made the fruit-growing industries of today highly specialized arts, perhaps the most significant development of all is the increased and steadily increasing public demand for fruit varieties of high quality. For this growth, particularly so far as Apples are concerned, Oregon, Washington, Colorado and other Western orchardists doubtless deserve considerable credit, first because they boldly nailed their colors to high standards of excellence, both as to variety and to character of specimen, and second because they deliberately set about the education of the public with respect to such standards. In these two directions they have not only themselves benefited, but they have performed a service alike to the consuming public and to fruit growers in general. Fruit growers in other sections have been steadily falling into line and the markets of our larger cities are annually being more liberally supplied with high-quality fruits.

Where did these Western and other growers of choice fruit get their standards? Did they adopt the *caveat emptor* (let-the-buyer-beware) policy which so often tends to arouse the righteous ire of the long-suffering and hoodwinked public? Not at all. Did they go to the growers of Ben Davis Apple, Kieffer Pear, Elberta Peach, Lombard Plum, Lady Thompson Strawberry and other low-quality varieties for their standards of flavor? No, indeed! Doubtless they are no more entitled to halos than are Eastern growers for the honesty of their pack, because the cost of transportation prohibits their adoption of dishonest packing methods; they have been forced to pack honestly or go to the wall. But where *did* they get their standards of flavor? Certainly not in the big commercial orchards of the Middle-West and the East—orchards of Gano, York Imperial, Baldwin, Rhode Island and other, at best, culinary varieties. No;

* Address before the American Pomological Society, Boston, 1917.

they ignored these plantations and went to sources which for them held more vivid and desirable ideals—the fruit plantations of their boyhood.

Those fruit plantations were neither set out by specialists nor primarily for profit. Their main reasons for existence were that the family enjoyed good fruit and wanted a continuous succession and an abundant supply throughout the year. Though doubtless many of these plantations were larger than necessary to supply even the largest families of those days, the surplus was just so much to give away to less fortunate relatives and to neighbors or to sell in the local market.

One of the most pleasing customs of those good old days, one that deserves to be revived today, owed its charm to the choice fruit grown in the family plantation. When visitors dropped in for the afternoon or the evening the *au fait* thing was to have the company enjoy some home-grown fruit before departing. This was not served in the modern sense now too frequently employed to indicate that the social session is at an end, but in the whole-souled spirit of hospitality in the extending of which both host and hostess could take a keener pleasure in serving a home-grown product and feeling that the favorable comments upon it were more genuine than is possible when purchased provender is provided. What would have happened if Ben Davis Apple, Kieffer Pear, Elberta Peach or Lombard Plum had been used instead of the choice varieties? Might not the guests have felt that as direct a hint was being given them as when in baronial times the cold shoulder of mutton was trotted out to apprise the guests that they had outlasted their welcome? But who would have planted or grown such inferior fruits with bore-bouncing intent? Would it not have wasted valuable land and time and also indicated a lack of resourcefulness on the part of host and hostess?

Upon no members of the family or of the district in those days was the influence of choice fruit so profound as upon the boys. Setting aside mothers' testimonies as biased we may perhaps accept the popular view, that boys are voracious animals, but it is slanderous to accuse them of having indiscriminating taste, accepting all as grist that comes to their mills. If the confession of one of them, now grown up, be insisted upon he would be forced to admit that he could always find the choicest specimens of the choicest varieties not merely in his father's and his near, and more or less dear, relatives' plantations, where he normally would be expected to be welcome by day, but in a very considerable range of territory and at hours when his elders had usually relegated their vigilance to less somnolent watchers, dogs, to be explicit, with which, however, he made it a point for obvious business reasons to be on terms of intimate friendliness.

The Ontario village in which my boyhood was spent is typical of hundreds from New England to Michigan and as far South as Maryland, if not of a much wider area. Practically every home had its garden and fruit plantation, which often consisted of an acre or more. Here I had unlimited free range in five fruit plantations, my father's, my grandfather's and those of three uncles and a less restricted range in many neighbors' gardens. Each of these had been planted to meet the personal taste of the family and to furnish a liberal supply of fruit throughout the whole year. Often the last of the Apples would be taken from storage when the first of the Strawberries were gathered. Again, since the smallest of these plantations was more than an acre set in the interplanted plan, popular in those days, the aggregate was a large list of varieties. Like many another boy of my day, while still in my teens I knew intimately fifty or more varieties of Apples, twenty-five or thirty of Pears, ten or fifteen each of Peaches, Grapes and Plums, six or eight of Cherries and a goodly list of bush fruits and Strawberries. This knowledge was fostered, supplemented and extended by studying varieties at the county fair where many of the boys, as well as their fathers, made exhibits.

While a reasonable proportion of the boys in those days went direct from school into some branch of farming and planted orchards more or less like the ones I have described and while a few took up commercial fruit growing, the majority went into other lines of business; but among these last are many, the influence of whose boyhood led them later in life to take up fruit growing either for business or pleasure. So far as I have been able to discover, they have, with remarkably few exceptions, chosen the varieties with which they were familiar during boyhood.

In those boyhood plantations fruits of low quality were conspicuous by their absence. Our fathers thought that what was not good enough for them was not good enough for other people. They turned deaf ears to the arguments that such varieties are robust, prolific, have fine color and that the lowering of quality will not be noticed by the public in general. They knew better perhaps than the present generation of commercial fruit growers that nothing so tends to develop an extensive demand as really fine fruit. For, to quote a favorite proverb, "The remembrance of quality lives long after the price has been forgotten." The man who eats a poor or indifferent fruit will not be tempted soon to eat or buy again; whereas the man who eats a good one wants another specimen right away. Not until money making became the ruling passion in orcharding were low quality fruits planted more extensively than for testing.

Though Ben Davis Apple and Elberta Peach must bear much

responsibility for curbing public appetites for Apples and Peaches, respectively, it seems safe to declare that no one fruit variety has played such havoc with public taste as has the Kieffer Pear. The train-loads of this whited sepulchre of a fruit that for the past twenty years or more have flooded the large city markets have led the public to believe that Pears in general are inferior fruits, fit only for canning, if that. Even the Bartlett has had its skirts soiled by the commercialism that prompts California growers to gather it too green and ship it to Eastern markets where its consequently flat flavor belies its fine color and thus begins what the Kieffer finishes, the suppression of the public appetite. Thus the rising generation has had little chance to learn the truth that the Pear is one of our richest, most luscious and delectable of fruits.

To be sure the reaction against such bar sinister influences has set in; men who have learned that the public is willing to eat really fine Pears have begun to risk the difficulties of Pear culture and to plant the choicer varieties, especially those that reach the market after the California Bartlett season has passed. The rising generation may therefore fare better than the present one.

While this commercial growing of fine varieties speaks well for the prospective improvement of public taste, it is just as much to be desired that the family plantation should become as prominent as in days of yore. In such plantations should be at least some of the choice varieties too difficult to grow or too sparsely productive to be considered for commercial ventures. For they certainly minister to the æsthetic admiration of color, form, fragrance and flavor, to say nothing of the pleasure of achievement in their production. But they exercise a still more subtle and important influence: they maintain and pass on to the rising generation high standards of excellence towards which commercial fruit ventures should always strive.

Before passing to our conclusion it seems necessary to criticize adversely much of the present-day literature and many of the fruit specialists of the agricultural colleges and experimental stations. The great majority of the writings on fruit growing within the past twenty-five or thirty years have too strongly emphasized commercial phases and given too little heed to the stigmatized "amateur" features of fruit growing as if these were of an inferior instead of a potentially superior order. Amateurs are frequently connoisseurs. The writers seem to have the dollar so close to their eyes that they can see nothing else. As a matter of fact, the great authorities on fruit growing—Coxe, Kenrick, Prince, Wilder, Hovey, Barry, Thomas, Manning, Lyon and the two Downings—were all amateurs, yet what does not the American public and especially the fruit grower owe them? They made fruit

growing popular, not only in their day but for ours. They undertook and with their own private capital completed monumental works. Nowadays the Government and the individual States pay their successors and supply the funds to solve modern fruit problems. Therefore, it behooves these successors to make broad, instead of narrow, specialists of themselves so they may sympathize with and encourage amateur, as well as commercial, fruit growing in their respective regions; for among the amateurs, probably far more than among the commercial fruit growers, are our authorities of the rising and future generations to be found. To determine the truth of this statement I suggest that my auditors examine the list of present-day investigators, teachers and writers on fruit growing to see how few are the sons of commercial, and how many of amateur fruit growers. The result I venture to say will be surprising.

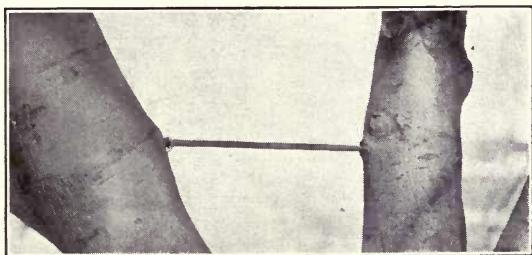
Let me hasten to say my audience is mistaken if it has concluded from these remarks that I advocate a return to the hit-or-miss methods of former days. I most certainly do not. I am a firm advocate of every method that makes for better fruit and more of it. What I have striven to emphasize is the importance of replacing the now largely decrepit fruit plantations with new ones of the choicest varieties to be handled according to the best modern methods. By the establishment of such plantations the standards of excellence will continue to rise or at least be maintained. Fruit growing should, and thereby can be made to minister perhaps as favorably as music, art and literature, to the sensibilities of the family, the community and the nation. And finally, such environments as superior family fruit plantations afford seem to be the most favorable for the training of future fruit lovers and specialists among the rising generation. Thereby home fruits will naturally continue as in the past to be educators of public taste.

As a postscript to the above address let me say a few words as to Originating New Varieties. In these days of Government and State departments of agriculture, of agricultural colleges and experiment stations, and of huge commercial fruit-growing interests, amateur fruit growers are too prone to consider themselves as merely *amateurs* and therefore relegated to a less useful class than that of the scientists. From the spectacular standpoint they are doubtless correct, because they have neither institution nor title to push them, whether worthy or not, into prominence. Nevertheless, without the least intention to belittle the work of the scientists it must be said that the world owes an incalculable debt of gratitude, to say nothing of monetary considerations,

to countless amateurs—printers, merchants, doctors, lawyers, lumbermen, millers, editors, factory hands, and last, but by no means least, nurserymen and farmers—who had no “college training” in agriculture, who in no sense considered themselves scientists, but who used what little knowledge they had to solve pomological problems for the love of still better knowledge to give to the world.

Perhaps the greatest service they have rendered is in the origination of new varieties. In this work they were largely gropers because the laws of plant breeding a generation ago were far less understood than today. Through enhanced knowledge this same field of variety origination offers even more wonderful opportunities than in the past. While beyond the scope of this volume, I am eager to point out that herein lies the greatest interest for the amateur; for just as in the past the originator of new varieties may do his work in a back yard now-a-days with far greater chances of making fortunate combinations of parents and of finding varieties superior to those now under cultivation than in by-gone days.

In support of this contention let it be remembered that Luther Burbank started his business life as a factory hand, but became a grower of vegetables and seeds before he became a variety originator. Though the practical results of his work have been exploited, magnified, distorted and even caricatured by the press, they doubtless compare favorably with those of other less conspicuous breeders; but his results seem to be of smaller consequence than his influence in awakening general interest in plant breeding. He has proved that new plants unlike anything hitherto known can be originated, and his work has thus become an inspiration to countless amateurs who seek to follow in his footsteps or blaze new trails for themselves.



A good way to prevent splitting of a Y crotch is by boring a hole in each arm for a belt, provided with a large washer at each end. Incorrect way is shown on page 46

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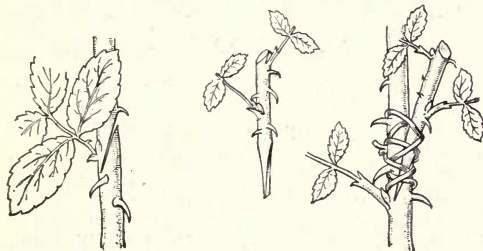
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